ATTACHMENT LIST

VA Product Effectiveness Applicable Documents

Table of Contents

Section 1.A
(1-27)

DEPARTMENT OF VETERANS AFFAIRS (VA)

FUNCTIONAL REVIEW (FR) PROGRAM

CONCEPT OF OPERATIONS

VERSION 2.6

December 2, 2011

TABLE OF CONTENTS

Revision History

Date	Revision	Description	Author
4/22/2008	0.0	Approved Version 0	Jennifer Ford
12/31/08	1.0	First Approved Update	Jennifer Ford
3/10/09	0.0	Approved Version 1.0	Jennifer Ford
12/31/09	2.0	Draft Version 2.0	Jennifer Ford
12/10/10	2.1	Draft Version 2.1 Update	Jennifer Ford
03/27/11	2.2	Draft Version 2.2	Jennifer Ford
04/22/11	2.3	Draft Version 2.3	Brad Branham
05/09/11	2.4	Draft Version 2.4	Brad Branham
09/22/11	2.5	Draft Version 2.5	Brad Branham
12/02/11	2.6	Draft Version 2.6	Brad Branham

I. Introduction

The Veterans Health Administration (VHA) is facing ever increasing demands to improve processes that serve our Veterans by developing high quality, efficient and cost-effective clinical and business Information Technology (IT) products. These demands are accentuated by an increased focus on accountability and transparency of IT investments and effective deployment of IT solutions. The Functional Review (FR) domain ensures that the needs of end users of VHA IT products are met by providing quality assurance reviews and checkpoints throughout the software development lifecycle to prepare IT products for operational readiness and to confirm stakeholder buy-in and adoption. The FR process adds value to the VA software development/deployment (and procurement) process by verifying that the customer requirements are interpreted correctly throughout a product's development (or procurement) and deployment lifecycle. FR serves as a mechanism to reduce project risks and increase the likelihood of project success through early identification of issues. The FR domain delivers an independent, technically-oriented requirements review and assessment to ensure requirements are accurate, measurable, testable, and technically sound in order to achieve product operational readiness. The FR service is most valuable when applied to all systems life cycle phases from initiation through monitoring & controlling, as shown below:

II. VA Leadership Direction

In July 2009, Secretary Shinseki announced the enforcement of the Project Management Accountability System (PMAS) as a management protocol that requires projects to establish milestones to deliver new functionality to its customers. Failure to meet set deadlines indicates a problem within the project. Under PMAS, a third missed customer delivery milestone is cause for the project to be halted and re-planned. Implementing a quality assurance service such as the FR program will help to build the confidence that the IT solutions that the VA is investing in are being effectively used to improve the lives of our Veterans.

PMAS, in conjunction with the analytical tools available through the IT Dashboard (http://www.oit.va.gov/dashboard.asp), will ensure early identification and correction of problematic IT projects. Starting in 2010, all IT projects at VA will be required to move to PMAS. The Obama Administration has made management reform a key government-wide priority. From IT accountability to personnel and contracting reforms, the administration is committed to providing better value, efficiency, and effectiveness for taxpayers' dollars.

III. FR Purpose and Value

The purpose of the Functional Review (FR) domain is to perform quality milestone reviews to surface issues and risks that may impede full adoption and readiness of a program or product, and define resolution paths and mitigation strategies to ensure success before delivering functionality to end users or stakeholders. The FR domain will also assess post-deployment effectiveness to determine if a program/product meets end user expectations. FR supports this purpose by partnering with our VHA customers to perform independent assessments and analysis on health and business, custom-developed and Commercial Off-the-Shelf (COTS) IT products to ensure they are effective and meet the needs of the customer in terms of function and operational readiness. Functional Review establishes a collaborative quality review process throughout the System Development Life Cycle (SDLC) to help identify and prevent problems before they become prohibitively expensive, in both time and cost to correct. The assessments executed by the Functional Review domain provide focused visibility for VHA project stakeholders into critical project issues.

Product Effectiveness FR strives to be the leader in defining and executing Software Development Lifecycle (SDLC) independent assessments and best practices, and to serve as the enabling entity for enhanced management decision support on IT products to VHA leadership. FR facilitates independent reviews of VA IT product requirements, usability, and operational readiness. The FR domain will assist the project team in providing an IT product that will functionally meet the stated needs of the customer. Through continual process improvement as well as close coordination with the ESM organization, the Office of Information and Technology (OIT), and Commercial off-the-Shelf (COTS) vendors, the FR process aims to become the accepted method for ensuring that the functionality requested by customers is successfully implemented into the finished IT product. The FR domain identifies requirements-related issues early in the product development/build and/or procurement phase, ensures test plans capture the correct test elements and adopt appropriate measures of effectiveness, traces requirements for accuracy and completeness, and assesses the operational readiness of a product prior to deployment. A key value-add component of the FR domain is to provide stakeholders with evidence to make go / no-go decisions on program or product delivery. In addition, FR brings the following value to any VA IT program:

1. Functional Review will assist the program by performing periodic quality ‘Peer Reviews’ of program artifacts during key checkpoints throughout the project life cycle and ensure that:
    - The highest quality product is delivered
    - Timely feedback to align with aggressive project schedules
    - PMAS milestones are successfully navigated

2. By communicating standard industry processes and tools, identifying potential risks, and validating that the solution is ready for release into a production environment; FR can help a program in ensuring the overall success of projects and avoiding critical shortcomings:

- Clinical Care Inconsistency
- Implementation Failure (Schedule Slippage, Deferral of Functionality)

IV. Purpose of Concept of Operations

The purpose of the Concept of Operations (ConOps) for FR is to describe the processes which will help identify requirements-related challenges up front, thus minimizing negative impacts on a project's delivery time, development costs and ultimately operational/service costs while supporting the Department's primary goal of providing excellence in patient care, veterans' benefits and customer satisfaction. The Product Effectiveness (PE) FR mission is to perform independent reviews and analyses on health and business IT and medical products as well as program, product and process improvements to ensure they are effective and meets the needs of the customer in terms of function, business case validation, benefits realization, and end user satisfaction. These reviews, along with collecting lessons learned for continuous processes improvements, provide VHA programs with evidenced-based information for decision support, validation and justification of investments. PE's role in managing the Functional Review process and employing a tailor-able process fulfills a service gap and adds measurable value to existing VHA programs, and the associated software development lifecycle (SDLC). Specifically, the PE FR process ensures that the developed or procured product meets VHA business owners' needs by providing:

- Focus on operational readiness
- An unbiased and independent review capability
- Data to support stakeholder evidenced-based decisions
- Assistance to customers by providing resources from a Process Asset Library
- Coordination and facilitation of working/advisory sessions with business owners
- Knowledge of the Program Management Accountability System (PMAS) and associated ProPath toolset

The FR process as described herein will continue to mature, and the Concept of Operations will be refined to reflect the additional knowledge that is gained from executing future customer engagements. This document will serve as a work in progress, and will be updated and improved upon as the team learns lessons from conducting the FR process. All updates shall be recorded in the "Revision History" which follows the Table of Contents.

V. Attributes of the Functional Review Process

The FR process, which can be tailored to the project at hand, is designed to help the project manager (PM) ensure that the developed or procured product is operationally ready and meets the needs of the business owner as captured by traceable functional requirements. The FR team develops a "peer" relationship, advisory in nature, with the project teams and provides information gathered via periodic quality reviews to project leadership to aid decision making for project next steps or continuation. The FR process may be tied to existing project milestones but will support the PM as she/he requires.

FR serves as a valuable resource to help reduce project risks and increase project success through early identification of issues. Specifically, the FR adds value by focusing on the following attributes and principles:

- **Tailored Quality Assurance Services**
  The FR team provides comprehensive expertise in project assessment and analysis and can provide detailed, independent reviews at key points in the project to surface issues and risks that may impede full adoption or readiness of a program or product. The Functional Review team will work closely with the project team to tailor the functional review process and identify those project reviews that will provide the most value and align best with the project, keeping in mind the timeline, resource constraints, etc.

  These reviews can either be formal or informal reviews as described below, and will be detailed in a project-specific Functional Review Roadmap document to be agreed upon with the project manager and other stakeholders as appropriate. Regardless of whether the review is formal or informal, a Summary Risk Assessment Report that includes a comprehensive list of project documents/artifacts reviewed will be delivered to the project team as an output of each functional review. The summary report includes observations noted by the FR team, associated risks, assessed risk level, and recommendations for risk mitigation.

  - **Formal Review Process** –The formal review process follows a structured approach where project artifacts need to be delivered at least 10 business days in advance of the functional review. The FR team will review the artifacts; note observations of anything that might be a risk to the project's success; and compile all observations, associated risks, and recommendations for risk mitigation into a Risk Assessment Report. The report will be vetted with key stakeholders in advance of the official functional review meeting so that there are no surprises during the functional review. The official functional review meeting will be held with stakeholders from the project team to review the observations, risks, and recommendations for risk mitigation. The formal review process is applied only when endorsed by program leadership, incorporated into the project schedule, and when a documented change control process is in place within the project.

  - **Informal Review Process** – As part of the informal review process, the Functional Review team will review project artifacts and produce a Risk Assessment Report. However, the review will be less formal and will align more closely with a peer-to-peer review.A peer review process establishes an engagement by the functional review team to review key project artifacts as they are produced throughout a product's life cycle. These key artifacts will be identified and agreed upon by the project stakeholders and the functional review lead. Once the project artifacts are produced, the

functional review team will assess the artifact(s) and provide observations, clarification questions, and recommendations back the project stakeholders in the form of a risk assessment summary report. There is not a formal Functional Review meeting to discuss all observations and risk identified with all stakeholders. The risk assessment summary report is delivered back to the primary stakeholder or project manager and it is their discretion what is done with the information.

- **Best Practice Guidance**
  The FR team applies its experience and knowledge of best practices to provide guidance and recommended mitigation strategies to ensure success, before delivering the product to end users/stakeholders.
  - Process Asset Library (PAL) Review and Guidance - In addition to the reviews described above, the FR team has developed a Process Asset Library (PAL) which serves as a repository of best practice knowledge artifacts, from which the FR team can provide the requisite tools and guidance to support the project team. This capability is provided early, and is backed up with FR's extensive experience, to provide value to the project manager as it becomes required.
    One artifact that the FR team has created to assist the project manager is the Project Artifact Checklist. The checklist lays out the main project artifacts that should be created during the course of a project, and which phase in the lifecycle the documents should be created and updated in. This not only calls attention to the documents that should be created, but can also be used to help project managers plan for the appropriate resource coverage to complete the documents.
  - Advisory Services - In the larger context the FR team will provide experience and advice to assist the PM in managing all aspects of the project including Program Management, requirements analysis/tracing, schedule development, risk management, configuration management, testing etc. The FR team will provide this expertise and guidance directly to the project leadership team for use as they see fit, in an advisory manner.

- **Product Usability Assessment**
  After a system is deployed, the FR team can perform a usability assessment to determine how users interact with the system and to determine how effective the product is from a functional perspective. FR leverages an industry standard for a usability framework in order to conduct its assessments, which incorporates best practices established by the National Institute of Standards and Technology (NIST) for Healthcare IT.

- **Maintain Independent Perspective**
  While the FR team becomes well versed in the project details and processes, it never becomes part of the PM management decision process. With no special allegiance to the specific project under consideration, the FR team can provide unbiased input to the PM throughout the development or procurement lifecycle. In addition, the FR team frequently coordinates with the Lessons Learned team in order to reference lessons learned from similar projects.

- **Emphasize Requirements Traceability**
  The FR team will focus on reviewing project requirements early in the project lifecycle to ensure they are well documented and can be clearly interpreted. Ensuring all requirements identified are designed, built/configured, tested, trained on, etc. is a critical element to ensure project success. Without completing traceability, the project runs the risk of requirements being left out from one (or many) phases, and resulting in the application not meeting part of the business needs, or users not being well trained in the functionality leading to gaps in user adoption. Throughout the project lifecycle, the FR team will focus on ensuring all requirements are traced through each phase of the project. If gaps in requirements traceability are identified, they will be raised to the project team for resolution.

  Additionally, many enterprise or industry level requirements are vital to ensure products perform properly at the national level, meet VA security standards, or meet Congressional mandates. Section 508 of the Rehabilitation Act of 1998, and Certification and Accreditation requirements (e.g. FISMA) are a few examples of requirements which must be incorporated into IT products. The FR team provides a focus on these important elements throughout the development or procurement lifecycle.

- **Emphasize Operational Readiness of the Information Technology (IT) solution**
  The end result of an IT project is to satisfy the business owner's need, but steps must be taken to ensure the organization is ready for the system to be deployed. Not performing training for the users of the system, for example, could result in a low user adoption rate and a perception of implementation failure because users will not know how to use the new system. This means the organization was not operationally ready for the deployment. The reviews conducted by the FR team of the project artifacts (including requirements, testing plan, training plan, deployment plan, etc.) and supplemental checklists that can be provided help ensure there is adequate focus on operational readiness for the organization. Additionally, the FR team has created a checklists specifically focused on operational readiness that could be provided to the project team as a means for the project team to self-assess their level of readiness.

VI. FR Engagement Requirements

Given the VA leadership direction and IT program goals, FR has made the following major assumptions about the implementation and operation of the FR process:

- ❖ Endorsement by Program Leadership
  - Stakeholders sign-off on Project Charter
  - In the case of formal reviews, quality assurance gate reviews are communicated as a requirement to Project Managers and incorporated into the Project Schedule per agreed upon details (task duration and dependencies)

- ❖ Scope of Functional Requirements in each Iteration (i.e. PMAS Segment) is concretely defined, in its entirety.

- ❖ Any changes to the expected functionality are monitored via a rigorous, documented change control process

- ❖ All functionality included in an iteration is addressed in the entrance criteria for the Functional Review.
  - Example : The Requirements Traceability Matrix (RTM) contains tracing for all applicable Business Use Cases (BUC)s assigned to that iteration.

- ❖ Entrance Criteria is a final version, with version control documented and provided to the FR team within the agreed upon schedule

VII. Scope for the Functional Review Domain

The scope for Functional Review includes custom development, commercial off the shelf (COTS) procurement, or a combination of both. While the majority of projects are developed within VA, a sizeable number of projects utilize COTS products or are fully COTS-based. The Functional Review process is valid regardless of the approach taken to obtain the product

There are numerous VHA projects nominated for development or procurement each year, and a finite amount of resources available to conduct Functional Reviews. Due to these limitations, projects selected for Functional Review are generally limited to projects which are considered High Value, High Impact or are of Special Interest as defined by VHA/VA leadership. Some examples of these criteria could be:

- Projects that are tied to a major initiative, iEHR, or Innovations
- Program levels valued at $10 million or more
- Programs that cover time spans of more than 18 months

Additionally, as the Integration Management team contacts prospective customers about the services provided by PE, the FR process will be highlighted and offered as a tool for their

success. Once charters are agreed to the Functional Review team will then begin planning with the associated project teams to implement the FR process within their projects.

At the project level, the FR process will be aimed at determining if the business owner needs are being met as defined in the requirements documentation. This includes visibility during the following key project milestones:

- Planning Phase – to affirm final agreement regarding the content of the Requirements Document by the business owner
- Design Phase – to review the system architecture and the software that will be implemented
- Build Phase – to confirm that the software is ready to enter the system validation testing phase of the project.
- Test & Training Phase – to verify whether the solution is ready for User Acceptance Testing (UAT) and other implementation activities
- Deployment phase – to verify that the solution is operationally ready and meets business owner expectations and end-user usability requirements

The FR process will NOT focus on the following project areas:

- Project Cost (unless it is impacted by a FR risk assessment)
- IT Help Desk or technical support

VIII. Overall Approach for Functional Reviews

This section provides a general overview of the approach that will be used to plan and execute the Functional Review process for a software project.

A. Initiation

Step 1:Due Diligence

Determine which type of functional review (formal vs. informal) adds the most value and aligns best with the project and associated factors such as:

a. Level of endorsement – in order to have a productive and successful formal review process, it is necessary to have senior leadership endorsement (via signature or project charters, which is defined in Step 2). This would define the highest level to which the functional review team would deliver risk assessment reports in the case of a formal gate review process.

b. Resources and governance model (e.g. PMO) – The level to which a PMO has been defined for the project (including a clearly defined Roles & Responsibilities (RACI) document) is criteria to determine whether the project would be best suited with a formal or informal process.

c. COTS vs. custom development

d. Timeline restrictions

e. Concurrence with PE

Step 2:Create Project Charter
Create Project Charter that details the formal/informal process that will be applied to the project. Within the Project Charter a Communications Plan should be documented which covers the following:

- General communications for recurring meetings such as strategic, status updates, action item reviews, sign-offs for end of phase, etc
- Escalation path
- Communications with Integration Management team to include other domains as appropriate
- Identification of integration processes if multiple PE domains are involved

Step 3:Strategic Plan & Schedule Review
Review the project's strategic plan and detailed schedule to gain a thorough understanding of the implementation approach and gain insights into project complexity, deadlines, etc. This knowledge will be used to tailor the functional reviews to those that are the most applicable and would offer the most benefit for the project at hand. The FR roadmap will be updated to align with the key milestones observed in the project's schedule.

Step 4:Draft Strategic Functional Review Plan
The FR team will create a tailored Functional Review Plan, also referred to as the "FR Roadmap", that outlines the recommended type and number of functional reviews for the project. In the case of a peer/informal review process, the functional reviews will represent when the expected risk assessment summary report is to be delivered to the stakeholder team. The FR team will review the plan with project stakeholders to ensure it is understood and to make any necessary changes to best accommodate the project team.

Step 5:Execute Functional Review Process
After the Functional Review Plan is agreed to by the FR team and the project team, the Functional Review team will be available to the project team as a peer advisor, and will begin preparing for the first functional review, or peer review assist, with the project as agreed upon within the Functional Review Plan. Generally, it is helpful for the Functional Review team to also be included on project status, change control meetings, vendor calls etc. so that they are aware of how things are progressing and can provide feedback or guidance throughout the project lifecycle and not only during the times of actual functional reviews.

B. Execution

PE will execute the FR process in accordance with the approved FR Process and Procedures[1] and in concert with memoranda of understanding and/or charters with the other VHA/VA Offices. Although FR does not focus solely on IT projects, the FR process uses the Software Design Life Cycle (SDLC) as the basis for product development, and consequently is aligned to support the SDLC. The primary SDLC phases include:

- Planning Phase
- Design Phase
- Build, Test & Train Phase (referred to herein as the "Implementation Phase")
- Deploy Phase
- Operations and Maintenance Phase

The specific level of business owner involvement in individual development efforts will vary depending on project prioritization, scope, and timeline. However, Functional Reviews will notionally occur at each phase of product development, and will strive to align with concurrent project milestones. A notional summary of the end-to-end process and the respective Functional Reviews is shown in Figure 1, and includes a brief description of the Functional Review, a rough alignment with the SDLC phase (discussed above), and the expected engagement level for that Functional Review.

[1] Functional Review Process and Procedures Manual provides a detailed, step by step process to plan and execute Functional Reviews

Milestone	Purpose	Schedule Alignment
Project Baseline Review (PBR)	Assess the initial performance measurement baseline and other key project artifacts	Planning Phase
Requirements Analysis Review (RAR)	Validate that requirements have been fully captured and can be mapped to specific business Use Cases	Planning Phase
Detailed Design Review (DDR)	Assess the system architecture and the software that will be implemented	Design Phase
Validation Readiness Review (VRR)	Ensure that the solution is ready to for System Validation Testing (SVT)	Build
Implementation Readiness Review (IRR)	Ensure that the solution is ready for User Acceptance Testing (UAT) and other implementation activities	Test & Train
Operational Readiness Review (ORR)	Provide assurance that the solution meets business owner expectations and end-user usability requirements	Deploy
Post Implementation Review (PIR)	Determine if the solution released into the production environment is operating as expected	Operations and Maintenance (O&M)

Figure 1: Notional Functional Review Process

It is important to stress that this Functional Review process is notional and that each product will have a tailored process to best support the business owner and stakeholders. The functional review for each of the phases will have its own focus, stakeholders, and artifacts. During each phase PE will:

- Provide support to the business owners and other stakeholders in the form of working sessions.
- Coordinate with the PE Lessons Learned (LL) domain in order to share best practices that are closely related to the project activities at hand.
- In the case of a formal review process : Prioritize, schedule, coordinate, and chair the Functional Review.
- Request appropriate business owner and stakeholder participation.
- Provide feedback to the business owner throughout the FR phase per a defined Communications Plan.
- In the case of a formal review process : Ensure relevant artifacts are distributed or made available to the attendees prior to the review.
- Document exception and action items
- Disseminate and track exception/action items.
- Develop, create and distribute a Functional Review Summary Report.

A summary of the Functional Review for each phase is provided below. Though technically not a Functional Review, a Project Kickoff will precede FR participation in the selected project.

Project Charter:

All projects in the functional review process will have a charter between PE and the respective customer. The charter will include an FR program overview, a project overview, project description, project timeline, key stakeholders and service related issues such as initial concept of operations or high level capabilities definition and potential OIT services. The project charter effort will be coordinated with the Integration Management team if multiple PE domains are involved; otherwise, FR leadership will lead the charter effort with appropriate project stakeholders. Two key elements of the project charter are to define the high-level milestones expected from the FR team and to identify any key risks/assumptions identified in the project initiation phase.

Functional Review Introduction:

All projects selected to participate in the Functional Review process will have an introductory meeting with all stakeholders to introduce the topic of Functional Reviews and to discuss the tailoring of the Functional Review process for that specific project. The goal of the meeting will be to discuss specific Functional Review objectives, conduct initial scheduling, assign responsibilities and action items, and capture issues and concerns. This kickoff may be part of a project-wide kickoff meeting conducted by the OIT project manager and/or COTS vendor; however, FR elements will be incorporated in the meeting. The sections below detail the FR milestones defined in Figure 1.

Project Baseline Review (PBR) and Baseline Operational Assessment:

- The Project Baseline Review (PBR) is conducted during the Planning Phase of the SDLC, and will review the entire project managent plan including the implementation performance measurement baseline initially developed for the project, ideally created by the project manager. Generally, the PBR is conducted at the Program or VISN level.
- For a formal process, the objective of the PBR is to obtain stakeholder concurrence that the scope and schedule established by the project are adequately documented and that the project management strategy is appropriate for moving forward in the life cycle.
- For a formal process, Scheduling of the PBR is usually done shortly after approval of the project, assignment of the Project Lead and the development team, and subsequent selection of the project for the Functional Review process. Generally, the business requirements will have been identified and completed by this time.
- PBR includes a review of the following key artifacts (this list will be tailored for each specific product and documented in the FR Roadmap):
    - Approved Business Requirements.

- Strategic Implementation Plan (Project Management Plan or Project Charter).
- Implementation Schedule.
- Roles and Responsibilities of the Stakeholders.
- Lessons learned from previous projects (as applicable).

- During the PBR, the above artifacts will be reviewed, with PE providing comments and a risk assessment. Stakeholder comments and concerns will be addressed with overall goal of concurrence to move the project forward in the life cycle.

Requirements Analysis Review (RAR)

- The Requirements Analysis Review (RAR) is conducted during the Planning Phase of the SDLC, and will affirm the final agreement regarding the content of the Requirements Document by the business owner. Generally, the RAR is conducted at the Program or PMAS Iteration level (depending on strategic plan and gap analysis requirements).
- The objectives of the RAR include:
  - Verify the requirements are complete, accurate, consistent, and problem free.
  - Evaluate the responsiveness to the business requirements.
  - Ensure the requirements are a suitable basis for subsequent design activities.
  - Ensure traceability between the business and system requirements
  - Ensure the each PMAS iteration is logically designed and planned so that full functionality can be delivered for that iteration and it does not rely on the functionality of future iterations (if required).
- RAR includes a review of the following artifacts (this list will be tailored for the specific product):
  - PBR Exception Report/Action Items.
  - Approved Functional Requirements per defined scope.
  - Requirements Traceability Matrix (RTM)
  - Change Control Report.
  - Lessons learned from previous projects (as applicable), provided by PE.
  - Draft Service Level Requirement (SLRs)/Service Level Agreements (SLAs) (if required).
- During the RAR, the above artifacts will be reviewed, with PE providing comments and a risk assessment. Stakeholder comments and concerns will be addressed with overall goal of concurrence to move the project forward in the life cycle.

Detailed Design Review (DDR):

- The Detailed Design Review (DDR) is conducted during the Design Phase of the SDLC, and will review system architecture, design interfaces, and detailed design features of the product that will be implemented. Generally, the DDR is conducted at the Program or PMAS Iteration level (depending on strategic plan and approved scope)
- The objective of DDR is to achieve concurrence that the design satisfies the functional and non-functional requirements, conforms to the VA's guidance and technical standards, and provides desired usability.
    - Hardware architecture document (includes security hardware architecture and performance hardware architecture).
    - Software Architecture document (includes security software architecture and performance software architecture).
    - System Requirements Specification (if available).
    - Interface Control Document (ICD) (if available).
    - System Configuration documentation.
- During the DDR, the above artifacts will be reviewed, with PE providing comments and a risk assessment. Stakeholder comments and concerns will be addressed with overall goal of concurrence to move the project forward in the life cycle.

Validation Readiness Review (VRR) or System Test Readiness Review (STRR):

- The Validation Readiness Review (VRR) is conducted at the end of the Build Phase of the SDLC, and will ensure that the software is ready to enter the system validation testing phase of the project. Generally, VRR is conducted at the Iteration, VAMC or Pilot level.
- Artifacts that will be reviewed during VRR include (this list will be tailored for the specific product):
    - DDR Exception Report/Action Items.
    - Updated Change Control Report.
    - Approved requirements and updated RTM.
    - System Test Plan.
    - System Test Artifacts (test cases, scenarios, and scripts)
    - Evolutionary Prototype (if available).
- During the VRR, the above artifacts will be reviewed, with PE providing comments and a risk assessment. Stakeholder comments and concerns will be addressed with overall goal of concurrence to move the project forward in the life cycle.

Implementation Readiness Review (IRR) or User Acceptance Testing (UAT) Readiness Review

- The Implementation Readiness Review (IRR) is conducted during the Test and Train Phase of the SDLC, and will provide assurance that the solution is ready for User Acceptance Testing (UAT) and other implementation activities, such that the required solution components can be installed and configured in the production environment(s). Generally, IRR is conducted at the Iteration, VAMC or Pilot level.
- The objective of IRR is to review the test results obtained during System Validation testing for completeness and accuracy, and to verify that test planning, test cases, scenarios, scripts and requirements traceability provide adequate coverage of documented functional requirements.
- Artifacts that will be reviewed during IRR include (this list will be tailored for the specific product):
    - VRR Exception Report/Action Items.
    - UAT Plan
    - UAT Artifacts (test cases, scenarios, and scripts)
    - Training Plan
    - Business Continuity Plan, to include SLAs
    - Deployment Plan
- During the IRR, the above artifacts will be reviewed, with PE providing comments and a risk assessment. Stakeholder comments and concerns will be addressed with overall goal of concurrence to move the project forward to the deploy phase of the life cycle.

Operational Readiness Review (ORR):

- The Operational Readiness Review (ORR) is conducted during the Deploy Phase of the SDLC, and will ensure that the solution is operationally ready, and meets business owner expectations and end-user usability requirements. Generally, ORR is conducted at the Iteration, VAMC or Pilot level.
- As part of a formal review process, the objective of ORR is to achieve concurrence, via a "Go or No Go" decision, that the solution that has been developed or acquired, tested, and implemented is ready for release into the production environment for sustained operations and maintenance support.
- User Acceptance Testing (UAT) is the responsibility of both the business owner and the developer (OIT). For projects involving a COTS vendor, the responsibility for UAT will be decided based on the particular project's circumstances but will usually be the business owner or customer. UAT results will be used during the ORR to determine if

the product is ready for deployment. PE will review UAT results to ensure accuracy, and reliability of the testing and provide an independent assessment of UAT results.

- Artifacts that will be reviewed at the ORR include (this list will be tailored for the specific product):
    - User Acceptance Test (UAT) results and corrective actions.
    - Operational Readiness Checklist.
    - Final Project deployment or implementation plan.
    - Final Continuity of Operations Plan (includes Support Transition Plan).
    - Training Results Summary Report.
    - Updated Requirements Traceability Matrix.
- During the ORR, the above artifacts will be reviewed, with PE providing comments and a risk assessment. Stakeholder comments and concerns will be addressed with overall goal of concurrence to conduct go live and follow-on implementation.

Post Implementation Review (PIR) and Product Usability Assessment:

- The Post Implementation Review (PIR) is conducted during the Operations and Maintenance (O&M) Phase of the SDLC, after a period of sustained operation (after at least one full reporting cycle has been completed), to determine if the solution that was released into the production environment is operating as expected. Generally, ORR is conducted at the Iteration, VAMC or Pilot level.
- The objective for PIR is to ascertain the degree of success from the project focused on the following:
    - The extent to which the project has met its objectives
    - Delivered planned level of benefit
    - Traceability of completed requirements as originally defined
    - Examine the efficacy of all elements of the working business solution to determine if benefits can be optimized, or new benefits delivered
    - Learn lessons from the project that can be used to improve future project work

- Artifacts that will be reviewed during PIR include (this list will be tailored for the specific product) :
    - Post deployment customer surveys (to be coordinated with the PE Customer Satisfaction team and focused on user adoption and implementation).
    - Product Usability Assessment
    - Lessons Learned Retrospect Report

- Benefits Measurement Report
- Implementation Completion Report.
- Operational Service performance as defined by the SLR targets.
- Service Performance Reports/Metrics as defined by an SLR (if available) and reported by Operations.

- During the PIR, the above artifacts will be reviewed, with PE providing comments and a risk assessment. Stakeholder comments and concerns will be addressed with overall goal of concurrence to continued system operation.

Specific details on each of the Functional Review steps are further described in the *Functional Review Process and Procedures Document*.

IX. Functional Review Process Risks and Mitigation Strategies

The FR team and its associated processes serve as an advisory resource to the project manager, to support the successful development or procurement of capability to the business owners. There are risks associated with employing the FR process. Following are the key risks that have been identified, along with the corresponding strategies that have been developed to mitigate each risk:

- RISK: Lack of project manager and staff acceptance (both internal and external) and buy in on process value.
- MITIGATION STRATEGY: Education about the PE Functional Review process will be provided to VA and VHA leaders and staff at many levels, as well as during introductory PE meetings with prospective customers. Understanding the value added from the Functional Review process by key stakeholders is essential to the success of the FR process. One approach is to use tactical examples to demonstrate the value of the process. In addition, prove the value of the process through effective contribution of valuable information and analysis results.

- RISK: The prospective project manager decides not to incorporate the FR team in the development or procurement project.
- MITIGATION STRATEGY: The PE organization and the FR team will provide a comprehensive description of the value of involving the FR team in similar projects. Summary information gleaned from past FR involvement will focus on value-add elements enjoyed by former project managers, and will highlight expected value which can be anticipated from FR participation.

- RISK: Geographically dispersed organization creates communication challenges across groups and locations.
- MITIGATION STRATEGY: Design a communications plan that addresses the requirements unique to VHA, and leverage the expertise of the steering committee and VHA user working group to identify obstacles and proactively resolve communications issues. Within the project plan, allot a sufficient amount of time for field prep activities.

- RISK: Members of the FR User Working Group are not able to consistently, actively, and substantively participate in this project.
- MITIGATION STRATEGY: The FR Team will actively communicate the goals for the project in an effort to facilitate buy-in and support for the effort. Additionally, team members' commitment to the project will be communicated by using this Integrated Project Charter to outline the responsibilities of the FR User Working Group. In order to adhere to the stated milestones, it is imperative that FR User Working Group members respond to requests for information (emails, phone calls, etc.) regarding the exit criteria within an acceptable timeframe (2-3 business days) and designate replacement members when out of the office.

- RISK: Incorporating FR tasks in the project schedule may have an impact on the time-line of implementation activities.
- MITIGATION STRATEGY: The FR Team will coordinate with the appropriate project stakeholders to propose a FR roadmap, detailing task duration and dependencies, which is aligned with the project implementation schedule in order to receive concurrence. The goal of the FR team is to avoid impacting the implementation activities at hand. Minimal schedule adjustments may be deemed necessary by the stakeholder team; otherwise, a de-scoping of FR tasks will need to be considered.

Appendix A : Stakeholders

For the FR team, the primary stakeholder will vary based on the engagement as detailed in the project charter. The FR team is committed to providing the primary stakeholder with the full array of resources, expertise and resources necessary to achieve a useful and functionally effective product.

Other stakeholders contribute significantly to the success of the project. The FR team will work with these stakeholders at appropriate points to further the goals of the project. The following is a list of the major stakeholders and a brief summary of how each may be involved in the process:

- **VHA Clinical and Business Communities**: These are the primary customers of the IT products and services. They are the source of the business requirements upon which the proposed IT development or procurement project is based; therefore they will be engaged by the FR team as recommended by the FR team and deemed advisable by the project manager.

- **Office of Health Information (OHI):** This organization is involved in many different aspects of the product development/procurement lifecycle, from defining the initial business requirements to measuring a product's effectiveness. Within OHI, the key stakeholders include:
    - *Chief Officer, OHI*: This individual has overall responsibility for overseeing the conduct of the FR process. Given the importance of successfully and accurately capturing requirements by the ESM office, and the subsequent development of a functionally useful product from these requirements, the Chief Officer will be briefed on the results of FRs which are conducted for all pertinent projects.
    - *Service Coordination (SC)*: The Service Coordination (SC) organization reports up through OHI. As such, SC serves to review the performance of the FR process, as well as communicate to the Chief Officer the overall status of the FR process. SC will ensure strategic alignment between IT service delivery and VHA business direction. From a macro perspective, SC will provide analysis of strategic trends, technical issues, solution scalability and performance metrics with potential to impact IT operations.
    - *Product Effectiveness (PE):* The four PE domains of Functional Review, Benefits Realization/Business Case Enhancement, Customer Satisfaction and Lessons Learned are managed in a comprehensive approach to product quality, ensuring that they work in concert with other VHA entities, and with outside VA organizations to achieve the quality goals desired within VA. Specifically from the FR perspective, PE is well placed to ensure the independent viewpoint necessary for objective process and product artifact and process review. PE, through the FR team, will specifically provide evidence-based recommendations

to the project manager on all major aspects of the development or procurement of the product. PE is also well positioned to provide current and informative information to its leadership as necessary, to assist the project manager and to keep business owners informed.

- *Enterprise System Managers (ESM)*: This organization is responsible for understanding the business needs of VHA clinical and business users and developing the business and functional requirements to meet those needs. Their participation is crucial to the FR dialogue; as the stewards of the requirements generation process they have both the duty and the means to adjust and mature the requirements to achieve early and successful direction towards useful functionality. They are both contributors to, and key recipients of, the outcomes of the FR process.

- **Office of Information and Technology (OIT):** OIT is responsible for building and/or adapting the IT products in accordance with the specifications and requirements defined by the ESMs, prioritized by the Health Information Systems Executive Board (HISEBs), and recommended by the Informatics and Data Management Committee (IDMC). They are also critical in the testing of actual software, and in their involvement in User Acceptance Testing (UAT), a key assessment point within the FR process. OIT employs a comprehensive development guidance platform called ProPath, which all IT development projects follow to support PMAS milestones. Lastly, OIT also manages the production environment where the product will often reside and subject matter expertise in this area is invaluable. OIT has recently instituted the Program Management Accountability System (PMAS) to ensure close management of all system development projects. The FR process aligns seamlessly with the PMAS approach and will permit value add to the projects as well.

- **Product Vendors**: Similar to OIT, third party providers of COTS products work with VHA to implement enhance and integrate solutions. The extent of their participation in the FR process will be driven largely by the particular product and the level of interface required.

Appendix B : PMAS Background

The purpose of this section is to provide an overview of the Veterans Affairs (VA) Project Management Accountability System (PMAS) and how the PE FR domain is aligned to support achievement of PMAS milestones. In addition, an example of how the PE FR domain tailored its approach to support the Health Claims Processing (HCP) pilot project achieve compliance with PMAS will be described in further detail as a case study. The alignment of FR services with PMAS will help to support the strategic goals of the programs supporting the Major Initiatives to succeed in the execution of PMAS checkpoints through assessments of critical project deliverables and communication of key risks to empower stakeholders to make informed decisions about the status of their program(s).

PMAS Overview
VA Information Technology (IT) consolidation was initiated in 2007 for the primary purpose of improving results of VA IT investments. Since this point, VA has made the commitment to review all ongoing development programs. Furthermore, a new Chief Information Officer (CIO) was confirmed. The new CIO was questioned in Senate hearings on how to address program issues; hence, significant change was necessary for the way IT projects were planned and managed at VA.

PMAS was designed to reduce risks and institute monitoring, controlling and reporting discipline; in addition, to establish accountability. PMAS requires all IT programs use incremental product build methods to focus on near-term, assured delivery of new capabilities to customers. Its intent is to improve the rate of success of VA's IT projects by:

- Ensuring IT Project Managers have access to all necessary resources to complete the project delivery milestones
- Implementing shorter customer delivery milestones (e.g. mini-UAT milestones every 6 months)
- Establishing disciplined management monitoring and control process to identify potential problems early (this aligns with FR objectives)

Managed projects are tightly monitored and subject to being halted should significant deviation to plan occur and insufficient remediation plans are presented. This presents an opportunity for independent assessments (e.g., FR). PMAS requires a project be paused and re-evaluated at the point where it has demonstrated trouble, but no later than after missing three consecutive customer delivery milestones. Effective mid-February, 2010, all IT development projects are being managed under PMAS. **PMAS is mandatory for all work under the Major Initiatives.**

Official Project Management Accountability System Definition
Project Management Accountability System is a rigorous management approach that will deliver smaller, more frequent releases of new functionality to customers. The intent of Project Management Accountability System is to ensure that the customer, project, and vendors working on a project are aligned, accountable, and have access to necessary resources before work begins.

In support of PMAS, **ProPath** was developed as a front-end tool to a Process Asset Library (PAL) with standard process information – tools to assist with measuring effectiveness of the development/deployment process (i.e., implementation). ProPath is a one-stop shop providing critical links to the formal approved processes, artifacts, and templates to assist project teams in facilitating their PMAS-compliant work. Visual flow representation makes it easy to retrieve information and comprehend processes. ProPath is System Development Life Cycle (SDLC) agnostic and reflects processes mandated for use with Agile, Linear, and any other defined SDLCs. Similar to the PMAS Guide, using ProPath is mandatory and is directly implied by the information in the Project Management Accountability System Guide and by the memorandum sent by the Chief Information Officer on December 3, 2009.

Case Study : FR Alignment with PMAS to Support Health Claims Processing

The purpose of the VA Fee Basis Program is to manage authorization, claims processing and reimbursement for services acquired from non-VA health care providers. In general, veterans seek health care at VA expense and obtain such care at VA facilities. Non-VA facility care, or the use of Fee Basis, is generally only authorized when appropriate VA services and/or facilities are not available or cannot be economically provided to the veteran due to geographical inaccessibility. The use of Fee Basis, or non-VA facilities, is not considered a permanent solution for veteran health care needs. The HCP Pilot Project is intended to replace the current Fee-Basis Claims System (FBCS) that is in place across the VHA today.

High Level Scope and Challenges:

- Implement a solution to address three business areas in three iterations:
  - Iteration #1 : Eligibility and Enrollment (EE)
  - Iteration #2 : Referrals and Authorizations (RAS)
  - Iteration #3 : Claims Adjudication

- Design and Build/Configure a system with multiple Commercial Off the Shelf (COTS) products that requires custom development for system interfaces and integration
- Coordinate amongst multiple teams within the VA
  - Chief Business Office (CBO)
  - Financial Services Center (FSC)
  - VISN 11
  - Other Stakeholders (e.g., OIT)
- Implement a Scrum methodology to apply an iterative, incremental approach for project management that is often utilized in agile software development; ideally, this will support the evolution of requirements and the respective solution through collaboration between self-organizing, cross-functional teams

The following steps were taken to tailor the FR Process to align with PMAS objectives, and ultimately tailor to the HCP project:

1. Understand PMAS Objectives and the ProPath process, with supporting tools (e.g., what's required vs. nice to have)

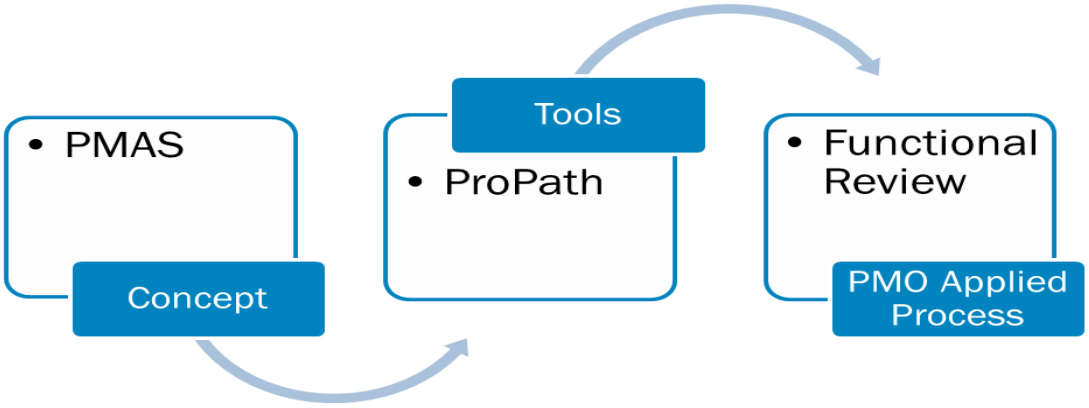
2. Integrate the Functional Review process with the ProPath process to create a new "FR Supporting PMAS" process roadmap

3. Tailor the new roadmap to the HCP project (3 incremental and overlapping phases) to create the "HCP FR Plan to Support PMAS Success", which is depicted in Table B.

    a. Implement an evolutionary prototype methodology to present product functionality early, validate business requirements, and course correct if needed

    b. Implement a mini-UAT process to validate the prototype and support PMAS 6-month milestone with "deployable" functionality

    c. Support Customer Acceptance, which is a PMAS requirement to close out an increment



PMAS drives the need for smaller, more agile, quality gate reviews to focus on critical events to support requirements traceability and completeness, functionality assessments to address effective usability, and testing validation to support operational readiness. The table below depicts a tailored FR Roadmap to support the HCP Pilot Project in its compliance efforts with PMAS.

Section 1.B
(1-30)

DEPARTMENT OF VETERANS AFFAIRS

FUNCTIONAL REVIEW DOMAIN

PROCESS & PROCEDURES

2.1

December 2, 2011

TABLE OF FIGURES

- Revision History

Date	Revision	Description	Author
12/16/2010	1.0	Draft Version 1.0	Jennifer Ford
3/23/2011	1.1	Draft Version 1.1	Brad Branham
12/2/2011	2.1	Draft Version 2.1	Brad Branham

I. Overview

The purpose of this document is to provide detailed process and procedures for conducting Functional Reviews (FR) in support of Veterans Health Administration (VHA) product development. The Functional Review process will be used to support decision making to improve VHA products and ultimately improve Veteran's healthcare. This process and procedures document provides a notional approach and is usually tailored to support specific products, customers, timelines, and objectives.

The FR Domain is a component of the Product Effectiveness (PE) group, which is organized under Service Coordination in the VHA Office of Health Information (OHI). PE's mission is to facilitate activities and perform independent assessments on IT products developed or purchased for VHA to ensure they are effective and meet the needs of the customer in terms of function, benefits realization, user satisfaction and the collection and incorporation of lessons learned. PE operations have been organized into four (4) separate but inter-related domains: Functional Review, Customer Satisfaction, Benefits Realization/Business Case Enhancement, and Lessons Learned.

The FR Domain within PE performs quality gate/major milestone reviews to surface issues and risks that may impede full adoption and readiness of a program or product, and define resolution paths and mitigation strategies to ensure success before delivering to end users/stakeholders. The Functional Review Process and Procedures (P&P) manual provides the high-level process as well as the steps required for proper execution of these Functional Reviews.

Figure 1 provides a brief summary of the individual Functional Reviews. It lays out the seven notional Functional Reviews that can be incorporated for each implementation. There are also two types of functional reviews (Formal and Informal). The specific functional reviews to be executed for a given implementation, as well as the type of review (formal vs. informal) are tailored to those reviews that will provide the most value and align best with the project, keeping in mind the timeline, resource constraints, program leadership endorsement, etc. As part of the initial engagement with each VISN, the Functional Review team will review the engagement's project schedule and create a Functional Review Roadmap which identifies the recommended specific Functional Review checkpoints for the engagement. The list of recommended reviews is reviewed with the engagement project manager and incorporated into the integrated project schedule.

FR Description	*VHA SDLC Alignment	FR Alignment	Engagement Level
Project Baseline Review (PBR)	Planning Phase	FR I	Program / VISN
Requirements Analysis Review (RAR)	Planning Phase	FR II	Program / Iteration
**Detailed Design Review (DDR)	Design Phase	FR II	Program / Iteration
Validation Readiness Review (VRR)	Build Phase	FR III	Iteration / VAMC
Implementation Readiness Review (IRR)	Test & Train Phase	FR III	Iteration / VAMC
Operational Readiness Review (ORR)	Deploy Phase	FR IV	Iteration / VAMC
Post Implementation Review (PIR)	Operations and Maintenance (O&M)	FR V	Program / VISN
VHA SDLC = Plan, Design, Build, Test & Train, Deploy, O&M ** Requires Coordination with OI&T and/or Service Coordination technical team			

Figure 1: Functional Review Description

This FR Process & Procedures document is comprised of two primary sections as follows:

- Overview – provides the purpose and overview of the Functional Review (FR) Process & Procedures.
- FR Process & Procedures – provides a tailored step-by-step detail performed throughout the course of administering the Functional Review process. The detailed work steps are broken out into the seven key Functional Reviews identified above plus a project initiation phase which is included at the beginning of every project.

The format used for providing the detail of each step and sub-step is based on a system/use-case approach as follows:

Phase X Name/Description	
Step	**X.0 Step Name/Description**
Prerequisite Step(s)	Steps that serve as predecessors to this step
Step Actions	Detailed procedures to completing this step
Duration	Approximate timeframe to complete the step and associated procedures
Product(s)	Name(s) of all product(s) that should be generated once this step is completed

Template	Examples of: 1) artifacts used to facilitate the completion of the step; 2) templates of the final deliverable(s) and 3) examples of completed products
Follow-up Step	Steps that can begin after the successful completion of this step

This tailored FR Process & Procedures document will evolve and be updated as the PE team applies lessons learned to this tailored process.

One of the primary goals of the FR process is to employ a repeatable, tailorable process which adds value to VHA-wide acquisition, procurement and implementation. The FR process ensures that the product meets VHA customers' operational needs by providing:

- Focus on operational readiness
- Independent PE assessments
- Stakeholder coordination on findings
- Early detection of issues / early correction / cost savings
- Compilation of all project artifacts

The FR process is adaptable and flexible, both in terms of those products that could benefit from Functional Reviews, and the preparation for the Functional Reviews. As mentioned above, each FR product will be reviewed within the specific project environment and an assessment will be made on the optimum approach for Functional Reviews. A tailored FR Project Plan will be developed for each VHA product.

II. FR Process & Procedures

Phase 0: Project Initiation	
Step	**0.1 Conduct PE Introduction**
Prerequisite Step	None.
Step Actions	1. Complete preparation and logistics for PE Introduction: a. Date/Time (allot one hour) b. Logistics (VANTS, LiveMeeting, etc.) c. Outlook invite d. PMO/Business Owner POC (including contact information) 2. Designate individual to record minutes and action items. 3. At the date/time of the meeting, dial into VANTS. 4. Conduct roll-call of meeting participants. 5. PE Director (or designated representative) will conduct an introduction of the PE/FR team and explain their roles and responsibilities. 6. PE Director (or designated representative) will go through the PE slide deck (template attached), answering questions. 7. At the end of the brief, request the PM to provide an overview of their acquisition/implementation. Details may include: a. Number/type of facilities b. Legacy product(s) (if any) c. Product(s) they are procuring d. Acquisition timeline e. Whether a Facilities Readiness Checklist has been completed f. Primary and Secondary PMO POCs g. Status of PMO committees 8. On conclusion of the discussion review action items and set a tentative date for follow-on meetings/visits.
Duration	1 hour
Product(s)	PE Introduction PowerPoint Brief FR Roadmap
Template	 VISN 3 - Product Effectiveness_Functi
Follow-up Step	Decision to engage PMO (Step 0.2).

Phase 0: Project Initiation	
Step	**0.2 Decision to Engage PMO**
Prerequisite Step	0.1 Conduct PE Introduction
Step Actions	1. Identify Implementation resource requirements: a. Scope of effort i. Determine whether effort will follow the formal or informal Functional Review process based on due diligence steps discussed in the FR CONOPS. b. Future meetings/visits c. Approximate effort required (near-term, far-term) d. Required skill sets e. Hours estimate 2. Identify available FR resources. 3. Setup meeting with PE Director to discuss "Go/No Go" Engagement Decision (or discuss in weekly PE meeting): a. If a "Go" decision by PE, proceed to Step 1.0. b. If a "No Go" decision, advise the PMO, and retain pertinent information for use in possible future determination.
Duration	1 week
Product(s)	White Paper to discuss solution and implementation approach
Template	None
Follow-up Step	Step 0.3 Develop Draft Charter

Phase 0: Project Initiation	
Step	**0.3 Develop and approve charter**
Prerequisite Step	0.2 Decision to Engage PMO
Step Actions	1. Reference the Project Charter template below when creating a Project Charter. (Note that the FR Charter may be either a stand-alone document,if FR is the only domain engaging with the particular customer, or an addendum to an Integrated Charter,if more than one PE domain is engaging the customer). 2. Draft Project Charter with information gleaned from discussions with PMO representatives. 3. Review draft Charter with PE Team; make corrections. 4. Submit and Review Draft Project Charter with Stakeholders. 5. Update Draft Project Charter with Stakeholder feedback. 6. Submit draft Project Charter for approval by the VHA Office of Health Information (OHI), Director of Product Effectiveness. 7. Submit Project Charter for signature to identified signatories. These individuals may be different than the full set of Stakeholders, and will be determined during the Charter review process. a.
Duration	2 days
Deliverable	Draft Project Charter
Template	 PE-PBM Pharmacy Re-Engineering Integ
Follow-up Step	0.4 Develop FR Execution Plan

Phase 0: Project Initiation	
Step	**0.4 Develop FR Execution Plan**
Prerequisite Steps	0.3 Develop and approve Charter
Step Actions	1. Interview PMO and stakeholders, and review project schedule to determine specifics of the candidate projectto develope the Functional Review approach and Plan. 2. Meet with the FR team to discuss tailored FR approach based on customer needs and any specific leadership guidance. 3. Develop tailored Functional Review Roadmap: a. Use notional approach in FR CONOPS and this P&P manual. b. Tailor scope and type of Functional Review as required. 4. Submit tailored Functional Review Roadmpa, including any recommended changes to the project plan, to customer for review. 5. Incorporate feedback into tailored plan.
Duration	2 weeks
Deliverable	FR Roadmap
Template	TBD
Follow-up Step	1.1 Conduct PBR PE Risk Assessment

Phase 1: Planning Phase - Project Baseline Review	
Step	**1.1 Conduct PBR PE Risk Assessment**
Prerequisite Step	0.4 Develop FR Execution Plan
Step Actions	1. Compile all the necessary artifacts for Phase 1: a. Approved Business Requirements Document (BRD) b. Request for Proposal (RFP)/Statement of Work (SOW) c. Strategic Implementation Plan (Program Management Plan or Project Charter) d. Implementation Schedule e. Roles and Responsibilities of the stakeholders f. Draft concept of operations or intended operational usage g. Lessons learned from previous projects (as applicable) h. Change Control Report/Log (if available) i. Readiness Checklist 2. Conduct Risk Assessment categorizing risk into 4 categories: a. Showstopper b. High c. Moderate d. Low 3. Compile Risk Assessment Report.
Duration	1-2 weeks
Deliverable	PE Risk Assessment Report. Customer Brief (if applicable)
Template	
Follow-up Step	1.2 Solicit Lessons Learned

Phase 1: Planning Phase – Project Baseline Review (PBR)	
Step	**1.4 Conduct PBR Working Sessions**
Prerequisite Step	1.3 Solicit Lessons Learned
Step Actions	1. Compile all artifacts: a. Approved Business Requirements Document (BRD) b. Request for Proposal (RFP)/Statement of Work (SOW) c. Strategic Implementation Plan (Program Management Plan or Project Charter) d. Implementation Schedule e. Roles and Responsibilities of the stakeholders f. Change Control Report/Log (if available) g. Readiness Checklist h. Draft concept of operations or intended operational usage i. Lessons Learned from previous projects (as applicable) 2. Compile all products: a. Action Items / Exception Report b. Minutes (including attendees and decisions) 3. Prepare Checklist: a. Stakeholders 4. Report status of routing to PE (as required).
Duration	2-3 days (to compile and review)
Deliverables	Project Baseline Usability Report Guidance Documents and Templates (if applicable) Workshop Agenda and Facilitation Documents (if applicable) Operations Manual (if applicable) Interview Report(s) Action Items
Template	
Follow-up Step	2.1 Conduct Working Sessions

Phase 2: Design Phase – Requirements Analysis Review (RAR)	
Step	**2.1 Conduct Working Sessions**
Prerequisite Step	1.4 Conduct Requirements Review Working Sessions
Step Actions	***This step may be iterative.* 1. Draft Working Session Agenda. 2. Promulgate to the meeting attendees. 3. Evaluate relevant documentation (Example: Requirements Specification). a. Review steps/tasks in the project plan. b. Recommend additional steps/tasks when appropriate for each project (if needed). c. Review start/finish dates for each task. d. Review task dependencies. e. Review resource assignments for each step. f. Review Project Plan for milestones and deliverables. 4. Discuss status of project with PM team and PE / FR team members. 5. Develop minutes from Work Sessions. 6. Update Overall Project Plan to reflect any feedback from the Working Session. 7. Distribute minutes to relevant stakeholder.
Duration	1 hour/iteration
Deliverable	Meeting Agenda Meeting Minutes
Template	TBD
Follow-up Step	2.2 Weekly Status Calls with Developer

Phase 2: Design Phase – Requirements Analysis Review (RAR)	
Step	**2.2 Weekly Status Calls with Developer (as required)**
Prerequisite Step	2.1 Conduct Working Sessions (as required)
Step Actions	***Normally this meeting is chaired by the vendor to report on progress, issues, risks, action items, and future plans. These steps assume that the vendor will plan and run the meeting.* 1. Review previous vendor weekly status call minutes/notes for action items. 2. Take action as required on action items. 3. Review vendor weekly status call agenda. Prepare as necessary for any PE action items/issues/items for discussion. 4. Participate in weekly status call taking notes as required. 5. Escalate high risk topics to FR lead/PE director. 6. Take action on action items as required.
Duration	1 hour/iteration
Deliverable	Email or phone communication to discuss high level risks.
Template	TBD
Follow-up Step	2.3 Solicit Lessons Learned

Phase 2: Design Phase – Requirements Analysis Review (RAR)	
Step	**2.3 Solicit Lessons Learned**
Prerequisite Step	2.2 Weekly Status Calls with Vendor
Step Actions	***Note: LL Domain will solicit Lessons Learned from stakeholders as required. Steps may include:* • *A review of what worked.* • *A review of what did not work.* • *A review of what should be repeated.* • *A review of what should be done differently.* 1. Follow steps in accordance with LL CONOPS/P&P document. 2. Lessons Learned collection may be generated and routed to appropriate stakeholders. ***Lessons learned are based on project results realized at the end of each phase or at the end of the entire project.*
Duration	1 week
Deliverable	Guidance Documents and Templates (if applicable)
Template	TBD
Follow-up Step	2.4 Conduct RAR PE Risk Assessment

Phase 2: Design Phase – Requirements Analysis Review (RAR)	
Step	**2.4 Conduct RAR PE Risk Assessment**
Prerequisite Step	2.3 Solicit Lessons Learned
Step Actions	1. Assemble relevant artifacts: a. PBR Exception Report/Action Items b. Approved Functional Requirements per defined scope c. Requirements Traceability Matrix d. Change Control Report e. Draft Service Level Requirements (SLRs)/Service Level Agreements (SLAs) (if required) f. User workflows g. Any updated deliverables from previous phases 2. Review progress to date. 3. Evaluate artifacts and progress for risk. 4. Perform Functional Review Checkpoint Assessment. 5. Summarize Functional Review Checkpoint Assessment into assessment report categorizing risk into 4 categories: a. Showstopper b. High c. Moderate d. Low
Duration	1 week
Deliverable	PE Risk Assessment Customer Brief
Template	TBD
Follow-up Step	2.5 Conduct RAR Peer Assist

Phase 2: Design Phase – Requirements Analysis Review (RAR)	
Step	**2.5 Conduct RAR Peer Assist**
Prerequisite Step	2.4 Conduct RAR PE Risk Assessment
Step Actions	1. Compile all the necessary artifacts for RAR: a. BRD/RSD b. Change Control Report c. Exception Report/Action Items d. Lessons Learned from previous projects (as applicable), provided by PE 2. Verify readiness of venue/logistics (day of RAR). a. Audio-visual/Computers b. Room c. Communications (Telephone) d. Draft templates 3. Meet/escort stakeholders/attendees. 4. Dial VANTS call-in line (1-800-767-1750) 5. Introductory remarks 6. Conduct RAR a. Record Exception Report/Action Items (ongoing updates to version created during PBR) 7. Stakeholder consensus on Functional Requirements 8. Stakeholders review RAR Checkpoint Exception Report/Action Items
Duration	3-4 hours
Deliverable	RAR Exit Criteria Validation, which is the formal documentation of the Checkpoint, is conducted in the next step Action/Exception Report
Template	TBD
Follow-up Step	3.1 Conduct Working Sessions

Phase 3: Implementation Phase – System Test Readiness Review (STRR)	
Step	**3.1 Conduct Working Sessions**
Prerequisite Step	2.4 Conduct Requirements Analysis Review
Step Actions	** This step may be iterative.* 1. Evaluate current Project Plan. 2. Evaluate test results obtained during development testing for completeness and accuracy. 3. Review the following documents, to ensure they provide adequate coverage of documented system requirements: a. Test planning b. Test cases c. Scenarios d. Scripts 4. Discuss Project Plan and status of Action Items with PM and PE / FR team members. 5. Develop minutes from Working sessions. 6. Update Overall Project Plan and Action Items to reflect any feedback from the PE discussion.
Duration	1 week (per iteration)
Deliverable	Project Planning Working Session Minutes Updated Project Plan Updated Action Items List
Template	TBD
Follow-up Step	3.2

Phase 3: Implementation Phase – System Test Readiness Review (STRR)	
Step	**3.2 Review Tailored Test Scripts and Use Cases**
Prerequisite Step	4.1 Conduct Working Sessions (if applicable)
Step Actions	1. Coordinate with PM to provide Tailored Test Scripts for Review. 2. Review Test Scripts for accuracy and completeness: a. Description of test b. Tester(s) (or qualifications required for tester(s)) c. Expected duration of test d. Step-by-step actions for the test e. Expected outcome(s) or result(s) for each step or action f. Pass/fail criteria for each step g. Metrics or data to be collected h. Supporting information such as screen shots or system requirements documentation i. Traceability of test cases to Requirements Traceability Matrix, and full coverage or requirements within the RTM. 3. Compile comments, modified test scripts, and recommended changes. 4. Provide review results/feedback to PM.
Duration	10-20 hours depending on number and complexity of test scripts.
Deliverable	Tailored Test Scripts with recommended changes. Guidance Document and Templates (if applicable)
Template	TBD
Follow-up Step	3.3 Conduct STRR PE Risk Assessment

Phase 3: Implementation Phase – System Test Readiness Review (STRR)	
Step	**3.3 Conduct STRR PE Risk Assessment**
Prerequisite Step	3.2
Step Actions	1. Compile all the necessary artifacts for STRR: a. DDR Exception Report/Action Items. b. Updated Change Control Report. c. Approved requirements and updated RTM. d. System Test Plan. e. System Test Artifacts (test cases, scenarios, and scripts)

	f. PE Risk Assessment (including test cases, scenarios, and scripts) g. Integrated Project Plan h. Evolutionary Prototype (if available). i. Applicable story boards, mockups, screen shots, work flows, sample outputs, and other applicable design artifacts that may impact testing j. Action/Exception Report 2. FR team collaborates on which artifacts and areas in which to highlight risk. 3. Conduct Risk Assessment categorizing risk into 4 categories: a. Showstopper b. High c. Moderate d. Low 4. Compile STRR Risk Assessment Report.
Duration	1-2 weeks
Deliverable	STRR PE Risk Assessment Report. Customer Brief Validation Checklist
Template	TBD
Follow-up Step	3.4 Conduct STRR Peer Assist (w/designated stakeholders)

Phase 3: Implementation Phase – System Test Readiness Review (STRR)	
Step	**3.4 Conduct STRR Peer Assist**
Prerequisite Step	3.3 Conduct STRR PE Risk Assessment
Step Actions	1. Verify readiness of venue/logistics (day of Checkpoint): a. Audio-visual/Computers b. Room c. Communications (Telephone) d. Draft templates 2. Ensure artifacts are available if required. 3. Meet/escort stakeholders/attendees. 4. Dial VANTS call-in line (1-800-767-1750). 5. Introductory remarks. 6. Conduct VRR: a. Record Exception Report/Action Items (ongoing) 7. Stakeholder consensus that the system is ready to enter system validation testing. 8. Stakeholders review VRR Exception Report/Action Items.
Duration	3-4 hours
Deliverable	VRR Exit Criteria Validation, which is the formal documentation of the Checkpoint, is conducted in the next step Action/Exception Report
Template	TBD
Follow-up Step	5.1 Conduct Working Sessions

Phase 3: Implementation Phase	
Step	**3.5 Conduct Working Sessions**
Prerequisite Step	3.4 Conduct STRR Peer Assists
Step Actions	** This step may be iterative.* 1. Evaluate current Project Plan. 2. Evaluate test results obtained during system testing for completeness and accuracy. 3. Review the following documents, to ensure they provide adequate coverage of documented system requirements: a. User Acceptance Test planning b. User Acceptance Test cases

	c. Scenarios d. Scripts 4. Evaluate Training Plan(s) to ensure adequate coverage of all system functionality and confirm that training is planned per user type (as applicable) 5. Discuss Project Plan and status of Action Items with PM and PE / FR team members. 6. Develop minutes from Working sessions. 7. Update Overall Project Plan and Action Items to reflect any feedback from the PE discussion.
Duration	1 week (per iteration)
Deliverable	Project Planning Working Session Minutes Updated Project Plan Updated Action Items List
Follow-up Step	3.6

Phase 3: Implementation Phase	
Step	**3.6 Conduct IRR PE Risk Assessment**
Prerequisite Step	3.5
Step Actions	1. Compile all the necessary artifacts for IRR: a. VRR Exception Report/Action Items. b. UAT Plan c. UAT Artifacts d. Training Plan e. Business Continuity Plan, to include SLAs f. Deployment Plan g. Action/Exception Report 2. FR team collaborates on which artifacts and areas in which to highlight risk. 3. Conduct Risk Assessment categorizing risk into 4 categories: a. Showstopper b. High c. Moderate d. Low 4. Compile IRR Risk Assessment Report.
Duration	1-2 weeks
Deliverable	IRR/UAT PE Risk Assessment Report. Customer Brief

	Validation Checklist
Template	TBD
Follow-up Step	3.7 Conduct IRR Peer Assist

Phase 3: Implementation Phase	
Step	**3.7 Conduct IRR Peer Assist**
Prerequisite Step	3.6 Conduct IRR PE Risk Assessment
Step Actions	1. Verify readiness of venue/logistics (day of Checkpoint): a. Audio-visual/Computers b. Room c. Communications (Telephone) d. Draft templates 2. Ensure artifacts are available if required. 3. Meet/escort stakeholders/attendees. 4. Dial VANTS call-in line (1-800-767-1750). 5. Introductory remarks. 6. Conduct IRR: a. Record Exception Report/Action Items (ongoing) 7. Stakeholder consensus that the system is ready for User Acceptance Testing and for implementation planning. 8. Stakeholders review IRR Exception Report/Action Items.
Duration	3-4 hours
Deliverable	IRR Exit Criteria Validation, which is the formal documentation of the Checkpoint, is conducted in the next step Action/Exception Report
Template	TBD
Follow-up Step	6.1 Conduct Working Sessions

Phase 4: Deploy – Operational Readiness Review (ORR)	
Step	**4.1 Conduct Working Sessions**
Prerequisite Step	3.3 Conduct IRR Peer Assists
Step Actions	* *This step may be iterative.* 1. Evaluate current Project Plan. 2. Evaluate test results obtained during User Acceptance Testing to determine if the product is ready for deployment. 3. Review the following documents, to ensure they are complete: a. Operational Readiness Checklist b. Project deployment/Implementation Plan c. Continuity of Operations Plan (including Support Transition Plan) d. Training Results Summary Report e. Requirements Traceability Matrix 4. Evaluate Training Results to ensure adequate coverage of all system functionality was provided 5. Discuss Deployment Plan and status of Action Items with PM and PE / FR team members. 6. Develop minutes from Working sessions. 7. Update Overall Project Plan and Action Items to reflect any feedback from the PE discussion.
Duration	1 week (per iteration)
Deliverable	Project Planning Working Session Minutes Updated Action Items List
Template	TBD
Follow-up Step	4.2

Phase 4: Deploy – Operational Readiness Review (ORR)	
Step	**4.2 Conduct ORR PE Risk Assessment**
Prerequisite Step	4.1
Step Actions	1. Compile all the necessary artifacts for ORR: a. IRR Exception Report/Action Items. b. Updated Change Control Report. c. UAT Results d. Operational Readiness Checklist

	e. Deployment/Implementation Plan f. Continuity of Operations Plan g. Training Results Summary Report h. Requirements Traceability Matrix i. PE Risk Assessment 2. FR team collaborates on which artifacts and areas in which to highlight risk. 3. Conduct Risk Assessment categorizing risk into 4 categories: a. Showstopper b. High c. Moderate d. Low 4. Conduct ORR Risk Assessment. 5. Compile ORR Risk Assessment Report.
Duration	1-2 weeks
Deliverable	ORR PE Risk Assessment Report. Customer Brief Guidance Document and Templates (if applicable)
Template	TBD
Follow-up Step	4.3 Conduct ORR Peer Assist (w/designated stakeholders)

Phase 4: Deploy – Operational Readiness Review (ORR)	
Step	**4.3 Conduct ORR Peer Assist**
Prerequisite Step	4.2 Conduct ORR PE Risk Assessment
Step Actions	1. Verify readiness of venue/logistics (day of Checkpoint): a. Audio-visual/Computers b. Room c. Communications (Telephone) d. Draft templates 2. Ensure artifacts are available if required. 3. Meet/escort stakeholders/attendees. 4. Dial VANTS call-in line (1-800-767-1750). 5. Introductory remarks. 6. Conduct IRR: a. Record Exception Report/Action Items (ongoing) 7. Stakeholder consensus that the system is ready for go-live and implementation

	8. Stakeholders review ORR Exception Report/Action Items.
Duration	3-4 hours
Deliverable	ORR Exit Criteria Validation, which is the formal documentation of the Checkpoint, is conducted in the next step Action/Exception Report Validation Checklist
Template	TBD
Follow-up Step	5.1 Conduct Working Sessions

Phase 5: Operations & Maintenance – Product Usability and Post Implementation Review (PIR)	
Step	**5.1 Conduct Working Sessions**
Prerequisite Step	4.3 Conduct ORR Peer Assists
Step Actions	** This step may be iterative.* 1. Review post deployment customer surveys (coordinated by the PE Customer Satisfaction team) 2. Review Product Usability Assessment 3. Review Lessons Learned Retrospect Report (coordinatd by the PE Lessons Learned team). 4. Review the following documents, to ensure they are complete: a. Operational Readiness Checklist b. Project deployment/Implementation Plan c. Continuity of Operations Plan (including Support Transition Plan) d. Training Results Summary Report e. Requirements Traceability Matrix 5. Evaluate the following documents to ensure completeness: a. Benefits Measurement Report b. Implementation Completion Report c. Operational Service performance as defined by the SLR targets d. Service Performance Reports/Metrics as definied by an SLR (if available) and reported by Operations. 6. Develop minutes from Working sessions.

Duration	1 week (per iteration)
Deliverable	Working Session Minutes
Template	TBD
Follow-up Step	5.2

Phase 5: Operations & Maintenance – Post Implementation Review (PIR)	
Step	**5.2 Conduct PIR PE Risk Assessment**
Prerequisite Step	5.1
Step Actions	1. Compile all the necessary artifacts for PIR: a. ORR Exception Report/Action Items. b. Updated Change Control Report. c. Customer Surveys (*coordinated by the PE Customer Satisfaction Team)* d. Product Usability Assessment e. Lessons Learned Retrospect Report (*coordinated by the PE Lessons Learned Team)* f. Benefits Measurement Report g. Implementation Completion Report h. Operational Service performance as defined by the SLR targets i. Service Performance Reports/Metrics as defined by an SLR (if available) and reported by Operations j. PE Risk Assessment 2. FR team collaborates on which artifacts and areas in which to highlight risk. 3. Conduct Risk Assessment categorizing risk into 4 categories: a. Showstopper b. High c. Moderate d. Low 4. Conduct PIR Risk Assessment. 5. Compile PIR Risk Assessment Report.
Duration	1-2 weeks

Deliverable	Gap Analysis and Recommendations Report Customer Brief Product Usability Assessment Interview Report(s)
Template	TBD
Follow-up Step	5.3 Conduct PIR Peer Assist (w/designated stakeholders)

Phase 5: Operations & Maintenance – Post Implementation Review (PIR)	
Step	**5.3 Conduct PIR Peer Assist**
Prerequisite Step	7.2 Conduct PIR PE Risk Assessment
Step Actions	1. Verify readiness of venue/logistics (day of Checkpoint): a. Audio-visual/Computers b. Room c. Communications (Telephone) d. Draft templates 2. Ensure artifacts are available if required. 3. Meet/escort stakeholders/attendees. 4. Dial VANTS call-in line (1-800-767-1750). 5. Introductory remarks. 6. Conduct IRR: a. Record Exception Report/Action Items (ongoing) 7. Stakeholder consensus for continued system operation 8. Stakeholders review PIR Exception Report/Action Items.
Duration	3-4 hours
Deliverable	PIR Exit Criteria Validation, which is the formal documentation of the Checkpoint, is conducted in the next step Action/Exception Report Lessons Learned
Template	TBD
Follow-up Step	None

Section 6 - Program Management/Improvements	
Step	**6.1 Conduct Review Sessions**
Prerequisite Step	None
Step Actions	* *This step may be iterative.* 1. Review self-assessment reports to determine integration/updates to FR ConOps or Strategic Planning documentation where appropriate. (coordinated by the PE Customer Satisfaction team) 2. Review Product Functional documents and Strategic Plan 3. Review Lessons Learned Retrospect Report (coordinated by the PE Lessons Learned team). 4. Review Acquisition documents and scoping statements 5. Review product demonstrations/prototypes 6. Develop minutes from Working sessions.
Duration	1 – 2 weeks
Deliverable	Summary Memo for Leadership Document Assessment Report Customer Brief (PPT) Self-Assessment Report
Template	TBD
Follow-up Step	None

Section 2.A
(1-98)

VETERANS HEALTH ADMINISTRATION (VHA)
OFFICE OF HEALTH INFORMATION (OHI)
PRODUCT EFFECTIVENESS (PE)

November 23, 2011

(776-C10158 OY1; DEL 1.3.1-01)

TABLE OF CONTENTS

Revision History

Date	Revision	Description	Government Reviewer
7/27/09	0	Version 1.0 DRAFT	Jennifer Ford
8/27/09	1	Version 2.0 DRAFT	Jennifer Ford
10/09/09	2	Version 1.0 FINAL	Jennifer Ford
12/31/10	3	Version 2.0 FINAL	Jennifer Ford
4/15/11	4	Version 3.0 FINAL	Jennifer Ford
07/03/11	5	Version 4.0 FINAL	Jennifer Ford
09/25/11	6	Version 5 FINAL	Jennifer Ford
11/21/11	7	Version 6 DRAFT	Jennifer Ford

Summary of Changes

Version	Location	Description
Version 2.0 DRAFT (12/31/10)	Pages 70-75	Added Appendix 10 – Guide to "Quick Win" Lessons Learned
Version 3.0 DRAFT (3/31/11)	Pages 75-79	Added Appendix 11 – Engagement Strategy
Version 4.0 DRAFT	Pages 36-41	Updated Roles & Responsibilities
Version 5.0 DRAFT		Added Appendix 12
Version 6.0 DRAFT	Page 10 Pages 31-32 Page 41 Pages 63-70	*Section VI*: Removed SC as direct report *Establish and Leverage Communities of Practice*: Introduced 'Yam Jam' *Phase IV*: Added Yam Jam to R&R execution activities *Appendix 6*: Added Yam Jam to CoP discussion

I. Executive Summary

The Lessons Learned program has been established within the Product Effectiveness (PE) group, which is organized under the Veterans Health Administration's (VHA's) Office of Health Information (OHI). PE's mission is to facilitate activities and perform assessments on IT products developed or purchased for VHA to ensure they are effective and meet the needs of the customer in terms of function, business case realization, and user satisfaction. PE operations have been organized into four (4) separate but inter-related domains: Lessons Learned (LL), Functional Reviews (FR), Benefits Realization (BR), and Customer Satisfaction (CS). This document will communicate the Concept of Operations for the LL program within PE.

This program establishes a formal Knowledge Management (KM) methodology that enables the capture, distillation, sharing, and transfer of lessons learned regarding VHA IT products and services. While the LL program resides in VHA OHI (PE), it is intended to provide value to other VA organizations, as well. The LL program methodology is intended to provide the foundation for Continuous Process Improvement (CPI) within PE as well as within OIT's development and procurement of IT products.

The knowledge that is captured via the KM methodology is distilled into valuable lessons learned and best practices that can be used to support evidence-based decision making throughout the VHA enterprise.

The Lessons Learned program is designed to contribute to increased effectiveness of VHA IT products by providing decision makers with valuable knowledge from previous and on-going IT product development and procurement efforts. This knowledge will support evidence-based decision making at all levels of VHA by providing guidance for future IT investments.

As the KM methodology is integrated into PE's and VHA's daily operations, and as the sharing and reuse of lessons learned becomes institutionalized, the VHA will find itself on the path to becoming a "Learning Organization." A Learning Organization is one where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole (reality) together[1]. Another, perhaps less ethereal, definition describes a Learning Organization as one that is skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights[2]. In other words, a Learning Organization learns from its experiences, both positive and negative.

[1] *The Fifth Discipline: The Art and Practice of the Learning Organization*, Peter Senge, 2006.
[2] Harvard Business Review on Knowledge Management, Building a Learning Organization, David A. Garvin, 1998.

This CONOPs begins with some background on learning organizations and Knowledge Management, and then describes the mission, vision, goals, stakeholders, and added value of the PE/LL domain. The document then presents and explains the core elements of the KM methodology that form the foundation of the LL domain, and decomposes those elements into discrete process steps that articulate how lessons are captured, analyzed, and shared with LL domain stakeholders. Finally, this CONOPs includes a series of Appendices that describe cases studies, scenarios, and additional details on the execution of the KM methodology.

II. Learning Organizations and Knowledge Management

Collecting lessons learned and developing best practices is rather common; however, collecting lessons that are useful for the end-user and then *transferring* those lessons for use within the organization in order to improve performance is rather rare.

Within a Learning Organization, people use processes and systems to generate, transform, manage, use, and transfer knowledge-based products and services to achieve organizational performance goals. The past, present, and future are linked by capturing and preserving historic knowledge (explicit and tacit), disseminating the knowledge within the organization, and applying this knowledge to sustain and improve itself in the future. This concept suggests that Learning Organizations have collective intelligence. The premise that underpins the concept of organizational collective intelligence is the positive correlation between the number of people within the organization that participate and the amount of knowledge harvested. This suggests that the greater the transfer of knowledge across an organization, the more intelligent it will be.

To facilitate organizational learning, the knowledge and experience that is generated by knowledge workers must be recognized, captured, organized, and preserved to enable its reuse by people other than those who generated it. Therefore, infrastructure (processes and systems) and behavior (seeking, sharing, and adopting/adapting knowledge) must be in place to enable the capture, sharing, and transfer of this content across all relevant elements of an organization and with the appropriate external partners. Additionally, procedures must be in place to integrate the content from multiple sources and make it available to parties that can act upon it to achieve organizational goals and objectives. Without accompanying changes in the way work is done, only the potential for improvement exists.[3]

Knowledge Management (KM) is the discipline that provides the framework and facilitates the cultural change for organizations to identify, create, share, and transfer knowledge. KM has been an established discipline since 1995 with a body of university courses and both professional and academic journals dedicated to it. Many private firms and government agencies have resources dedicated to KM.

[3] Harvard Business Review on Knowledge Management, Building a Learning Organization, David A. Garvin, 1998

The best KM programs are typically tied to organizational objectives and are intended to achieve specific performance improvement outcomes. The experiences of two organizations illustrate this: Hewlett Packard and British Petroleum (BP). Several years ago, Hewlett Packard realized it needed to better leverage its knowledge. Customers demanded innovation and rapid execution. Although customers were satisfied with Hewlett-Packard's overall performance, they thought they could get more value. As a result, the company embarked on a KM program to improve how it managed knowledge across the entire organization[4]. However, Hewlett-Packard only wanted to manage the most useful knowledge−that which would produce business results. As such, their KM program was focused on three objectives: 1) Balance the reuse of knowledge with innovation (a key business driver for the company); 2) Promote pervasive leveraging and sharing of knowledge; and 3) Integrate the sharing of knowledge into work practices so that it will become part of daily work.

British Petroleum, one of the world's largest companies, has a worldwide reputation for commitment to knowledge management. Several years ago, BP's organizational structure evolved significantly towards an entrepreneurial, empowered "federation" of 100 business units. Each has a high degree of autonomy, yet they all share a growing sense of interdependence and awareness that in order to meet their aggressive performance targets, they will need to learn both from and within each other. This need drove BP to embark on establishing a world-class Knowledge Management methodology, to which BP business managers have attributed more than $260 million of added value for the company.

III. Lessons Learned Mission Statement

The mission of the Lessons Learned program is to increase the effectiveness of IT and medical products as well as program, product, and process improvements by providing decision makers with valuable lessons from previous and on-going development and procurement efforts. This knowledge will support evidence-based decision making at all levels of VHA by providing guidance for future investments and implementation procedures.

IV. Vision for VHA's Lessons Learned Program

The vision for the Lessons Learned program, as shown in Figure 1.0, is to transform the VHA into a Learning Organization, where capturing, sharing, and leveraging experience and know-how to improve performance becomes a routine way of doing business. People share what they think others may need to know, the latest know-how, experience, and Best Practices are routinely embedded in strategy and operations, and people and their collective knowledge are secure, easily accessible, and highly visible. The Operational Scenario in Appendix 2 amplifies on this vision.

[4] The Complete Idiot's Guide to Knowledge Management, Melissie Rumizen, 2002

VHA will be recognized as a leader in Knowledge Management processes, mechanisms, and systems that are used to continually enhance its capabilities and those who work with it, or for it, to achieve sustainable improvements for themselves and the communities in which they participate[5].

The Lessons Learned Program will also provide a means to mitigate the risk of "brain drain" as the older and experienced members of VHA transition to retirement. The processes and tools provided by the LL program will be used to routinely capture and transfer the knowledge of the retiring employee for reuse by the remaining staff, and serve as the primary source of job related knowledge for new employees. In this way, new knowledge retention initiatives will not be required every time someone leaves the workforce. The processes and tools provided by the LL program will serve as the "Memory of the Organization."

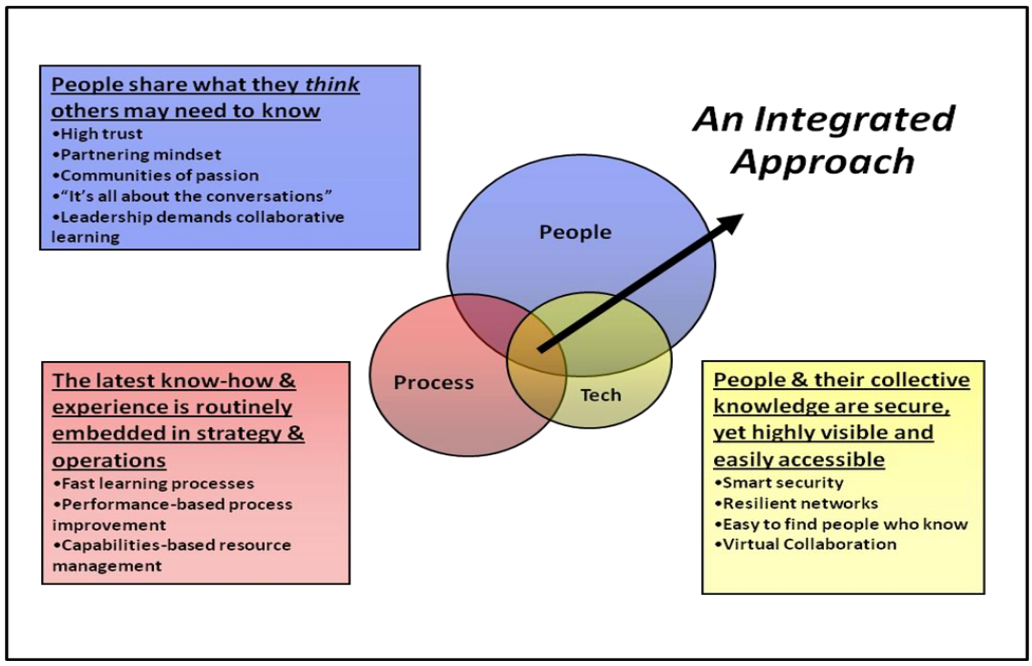


Figure 1.0: A Learning Organization

[5] *Learning Organizations*, eds., Sarita Chawla and John Renesch, Productivity Press, 1995

V. Goals for the Lessons Learned Program

As stated in the Mission Statement, the focus of the Lessons Learned program is to provide decision makers with valuable knowledge from previous and on-going IT product development and procurement efforts. In support of this Mission, the following goals must be achieved:

Specific goals of the Lessons Learned Program include the ability to:

- **Integrate learning processes into the project plans of new and on-going VHA IT projects, as well as into PE operations:** The learning processes (Peer Assist, Action Review, and Retrospect) are described in Section IX of this document, and are the foundation for PE's lessons learned framework. They are the mechanisms for harvesting and transferring lessons learned on new and on-going VHA IT projects to the right people, and at the right time. But in order to be successful, these processes must become fully integrated into each and every IT project plan, and the PE staff responsible for the conduct of these processes must be fully trained on their implementation. In addition, these processes must be integrated into PE's processes such as Functional Reviews, for example. Learning must come from the IT projects, as well as PE's execution of its processes.
- **Develop a lessons learned research and analysis capability:** As lessons learned are harvested from new and on-going VHA IT projects, PE must have staff available and skilled at analyzing those lessons for applicability to other IT projects, as well as for trends across IT projects that may present lessons for the VHA enterprise. The PE staff must also recognize lessons learned trends that articulate a Best Practice for VHA. In addition to the learning processes applied to VHA IT projects, PE staff must also have the ability to research lessons learned on related projects from other organizations. This is particularly important when a new VHA IT project has no precedent within VHA, and thus no lessons learned from other VHA projects. In this situation, the PE staff must have the ability to look outside VHA for sources of lessons learned.
- **Develop and sustain Communities of Practice:** Social networks and CoPs, described in Section IX of this document, are a critical component of a sound Knowledge Management-based LL methodology. They provide a framework for people with similar interests (for example, a community of practitioners across the United States deploying a specific type of IT system) to connect with each other, ask questions, share insights, and build new knowledge. PE staff must have the ability to develop & sustain these communities for the benefit of VHA.
- **Develop and sustain Knowledge Assets:** As Best Practices are identified, PE staff must have the ability to summarize, package and make those Best Practices with the end user in mind−those who need it. These Best Practices must be

presented in a way that makes them easy to understand and transfer in order to impact VHA's performance. These Knowledge Assets, described in Section IX of this document, must also be easily accessible, and PE staff must ensure they are updated to reflect the latest Best Practices.

- **Provide the technology infrastructure to support leaning processes, CoPs, and Knowledge Assets:** Knowledge Assets and CoPs must be accessible to the right people anytime, anywhere. They must be reliable and easy to configure and manipulate. PE staff must define the IT infrastructure requirements to support this Knowledge Management methodology, to include the harvesting of lessons learned in both face-to-face and distributed environments.

VI. Description of Stakeholders

Commitment from key stakeholders will be vital to ensuring the short and long-term success of the PE/LL program. The following is a list of the primary stakeholders and a brief description of how each will be involved in the process:

- **Office of Health Information (OHI):** This group is involved in many different aspects of the IT product lifecycle, from defining the initial business requirements to measuring a product's effectiveness. Within OHI, the key stakeholders include the following:
  - *Chief Officer, OHI*: This individual will have overall accountability for the implementation of the LL program and the distribution of the results. In addition, there is a possibility that knowledge gathered within the LL program may be used to indicate or explain the outcome of high visibility VHA IT programs, and could therefore get included in a presentation to members of Congress.
  - *Product Effectiveness (PE):* The LL domain will have primary responsibility for collecting, analyzing and disseminating the LL information. Additionally, the Functional Review, Business Case Enhancement/Benefits Realization, and Customer Satisfaction domains will all interface with LL in order to capture and share lessons gathered from their VHA customer engagements as well as lessons on how these domains conduct their work.
  - *Enterprise System Manager (ESM*): This organization is responsible for understanding the business needs of VHA clinical and business users and then developing the business and functional requirements to meet those

needs. The ESMs will be a primary customer for (and provider of) the information gathered by the LL program as they can apply this information to create, validate and/or modify existing IT product requirements. ESMs also compile the information that is used in the IDMC and HISEB meetings, and therefore may be able to include relevant LL information to help these groups in making select IT product decisions.

- **VHA Clinical and Business Communities**: These are the primary customers of the IT products and services through which change may be driven as a result of the LL information collected. These groups will provide information to the LL program, primarily through involvement with PE engagements. Additionally, the Health Information Systems Executive Board (HISEB) or Informatics and Data Management Logistics Committee (IDMC) may use the LL information to make project selection and prioritization decisions or to support the creation of an NSR. The LL information will also be leveraged to develop business cases and for requirements definition.
- **Veterans**: Because our Veterans are the ultimate customers for every organizational entity within the VA, they will ultimately benefit from the improvements made to IT products and processes as a result of this program.

Additional ancillary stakeholders may include:

- **Office of Information and Technology (OIT):** This organization is responsible for implementing the requirements defined by the ESMs and prioritized by the IDMC and HISEBs and maintaining the operational readiness of the IT assets in the field. Additionally, the LL information may be valuable input for operational readiness determinations and design considerations – especially those related to human factors and usability, and change control board, field testing and national rollout decisions.
- **External Product Vendors**: Similar to OIT, third party providers of COTS products work with VHA to implement, enhance and integrate IT solutions. LL information may be used to help the organization work with these vendors by providing feedback that will help to improve the delivered solutions.

VII. Scope for the Lessons Learned Program

The PE/LL program will collect, analyze, and disseminate lessons learned insights on VHA IT products and services used by clinicians and technicians in the context of hospital operations and the delivery of services to Veterans.

Lessons learned and best practices will be collected, analyzed, and disseminated in the course of operations within the four PE domains: 1) Benefits Realization; 2) Functional Reviews; 3) Customer Satisfaction; 4) and Lessons Learned. Within each of these domains, specific lessons may be discovered in such areas as performance management, program management practices, usability and human factors, deployment and implementation, survey results, and other knowledge areas relevant to VHA's IT organization.

Given this scope, the primary customers for the Lessons Learned Program will be:

- VA IT product/service users (Program Office, VISNs, VAMCs)
- Product Effectiveness
- VHA OHI
    - Chief Health Informatics Office (CHIO)
    - ESM Office
- VA OIT
    - IT product/service developers
    - IT product/service deployment managers and organizations

As depicted in Figure 2.0, lessons learned and best practices are collected and analyzed from three perspectives:

- **IT projects:** What lessons and best practices can we share to improve the performance of VHA IT projects that are about to begin or are ongoing? What insights have we gained from past projects that we can provide the IT project team to help them develop better plans (development, deployment, implementation, etc) and accelerate successful start-up? Additionally, as a new or ongoing project is implemented, what new learnings and/or best practices can we discover from that project that might be useful to future projects that we don't yet envision?
- **PE processes:** What lessons and best practices are we discovering from the execution of PE's four domain areas? How can we improve the effectiveness and efficiency of PE's processes for the benefit of VHA?
- **VHA Enterprise:** As PE gathers and analyzes lessons learned and best practices on specific engagements, what trends suggest potential lessons and/or best practices for the VHA Enterprise?

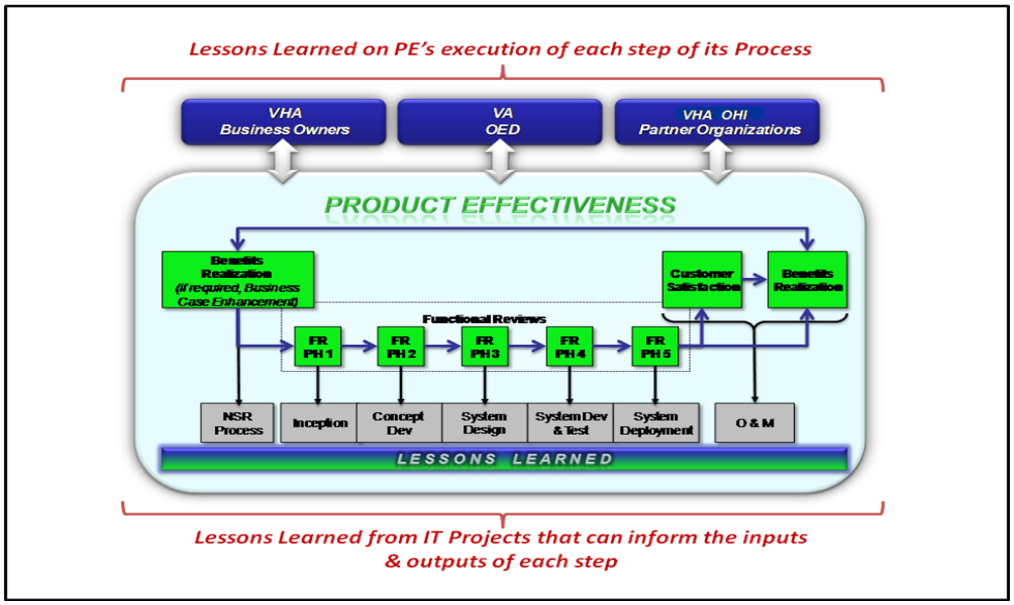


Figure 2.0: Scope of PE Lessons Learned Program

The PE/LL program collects lessons learned information regardless of the outcome of the lesson, whether it is positive or negative. The reason for this is to ensure not only that information is collected that describes what worked successfully, but also what did not. The primary factor in determining the value of the knowledge collected is not whether the outcome was positive or negative, but rather the magnitude of its impact and understanding the actions that can be taken to do better next time.

Additionally, because the focus for this program is to gather the lessons learned information that will enhance decision making to improve the effectiveness of VHA IT products and services, there is no intention at this stage to extend the program beyond VHA.

VHA OHI and senior management will be presented reports that describe recommendations based on the lessons learned that emerge from actual work experience and the facts that support them. Senior management can apply the acquired knowledge to support OIDs that will promote the repetition of successes, and limit the repetition of mistakes.

ESMs will benefit from having the lessons learned as they relate to the products that fall within their areas of responsibility. They can incorporate this knowledge into the requirements gathering and development process and make recommendations to their customer base regarding future enhancements.

VIII. Added Value of Lessons Learned

Managers need knowledge to make effective decisions. They need knowledge that is relevant, insightful, accurate, and timely. A manager with access to the best knowledge

at the right time and with access to the right people is more likely to make better decisions. *Better decisions contribute to increased effectiveness and efficiency of VHA IT products and services, which in turn translates directly to improved patient safety at VHA facilities.*

The PE/LL program will assist managers in making informed decisions through organizational learning. A properly implemented KM methodology provides a step-change in organizational productivity by accelerating the transfer and use of existing knowledge, as well as improved organizational speed and agility as managers and others learn, decide, and adapt faster than ever. The result is a Learning Organization that can quickly access and build on experience and ideas to fuel innovation.

As knowledge from the outcomes of previous decisions is harvested and analyzed, an understanding of what worked, why it worked and how it might work again is derived. Similarly, an understanding of what failed, why it failed and how to avoid failing again is also derived. In some cases, what was learned from past experience is no longer relevant. This demands a new way of working, one that requires an organization to learn fast from every new situation it encounters. In the case of a service organization such as the VHA, this means learning quickly every time it makes a decision delivering its services, or decisions made while implementing a new system to support its service delivery.

The potential return on investment (ROI) in the PE/LL program and thus in a Knowledge Management methodology can have both immediate value and long-term strategic value. Cost improvements are helped by enabling greater productivity with more accuracy and better controls as lessons learned are adopted and implemented. Favorable ROI can come from the following areas:

- **Cost reduction:** The most tangible aspect of savings comes when current operational costs are eliminated or reduced, including costs associated with making similar mistakes repeatedly either due to ignorance, poor policies and procedures.

- **Cost avoidance:** Industry analysts estimate that up to 60% of all content, documentation, and other project deliverables are recreated because it is lost or otherwise mismanaged.[6] Avoiding such costs—as well as unnecessary expenses such as extended training/orientation of new employees as a direct result of poorly managed knowledge assets—can earn immediate and long-term returns.

- **Increased production:** Leveraging what already worked somewhere else typically results in greater output or production. For example, if a VHA deployment team learns lessons from their deployment of an ARK system at VISN "X," then that team should be able to deploy the same ARK system quicker

[6] Knowledge Management Essentials, Denise Bedford, Ph.D., Kent State University 2008

in VISN "Y." This, in turn, means the team should, over time, be able to deploy that system to more VISNs in a given period.

- **Innovation:** By developing a formal KM methodology, lessons learned and best practices can be shared proactively with those who may not know it exists or who may not realize they can benefit from it. An IT system associated with the KM methodology can provide a robust search capability in order to reduce the time spent locating other people and relevant content. Collectively, such a KM methodology, if properly implemented, will lead the VHA toward becoming a Learning Organization. The result, as shown in Figure 3.0, is a capacity to create and share new knowledge and ideas that matter, which facilitates innovative thinking in the organization.

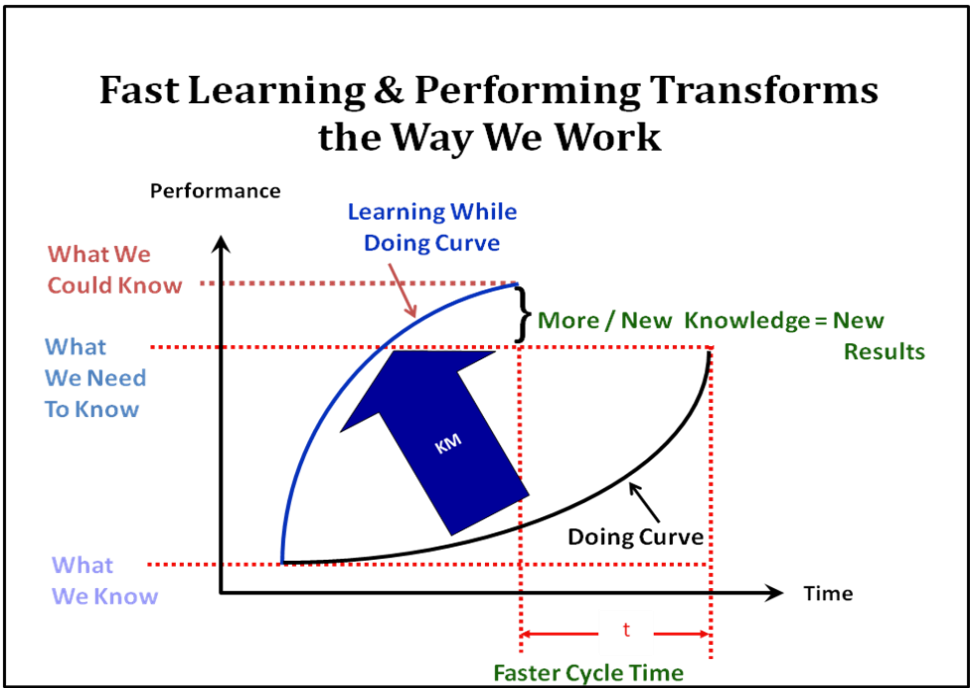


Figure 3.0: Transforming the Way We Work

Although cost-reduction alone may justify investment in a KM methodology, there are strategic business benefits to consider as well. Though harder to quantify, enhanced decision making through evidence-based management, making improvements to policies and procedures, and implementing lessons learned through customer satisfaction surveys, will all result in improved organizational morale – an intangible, yet critical, strategic benefit. The KM methodology will increase communication, efficiency and productivity organization-wide and address the costly inability of workers to leverage what their peers know.

IX. Lessons Learned Terminology and Key Concepts

Knowledge is one of the primary organizing principles of society. People are sought out and employed based on the knowledge they possess. Organizations, in theory, should then possess the sum of the knowledge possessed by the people in the organization. However, this is typically not the case due in part to the limited applicability of the knowledge to the needs of the organization, but also due to the barriers to capturing, sharing and managing knowledge. It is impractical to know what everyone knows, and the sheer volume of knowledge is impossible to manage. Therefore, an organization requires a formal, disciplined process through which to navigate around these barriers and use its collective intelligence to accomplish its objectives, i.e., a Knowledge Management methodology.

The PE/LL program has instantiated a formal KM methodology within VHA. This approach, based upon a methodology originally pioneered by British Petroleum, has been successfully applied in many Fortune 500 companies and government agencies over the last several years. At the heart of this KM methodology is a focus on delivering performance improvement where a business imperative exists *and* where knowledge can make a difference to the desired performance outcomes. This approach will support the PE goal of increasing the effectiveness of VHA IT products by:

- Generating and identifying relevant learning and knowledge (in the form of lessons learned and best practices) from work experience
- Capturing that relevant learning and knowledge
- Facilitating an analysis of that learning and knowledge
- Sharing and transferring learning and knowledge to those who need it
- Storing learning and knowledge for future reuse

PE's KM methodology is based on integrating four key elements, as shown in Figure 4.0 and described in the following pages.

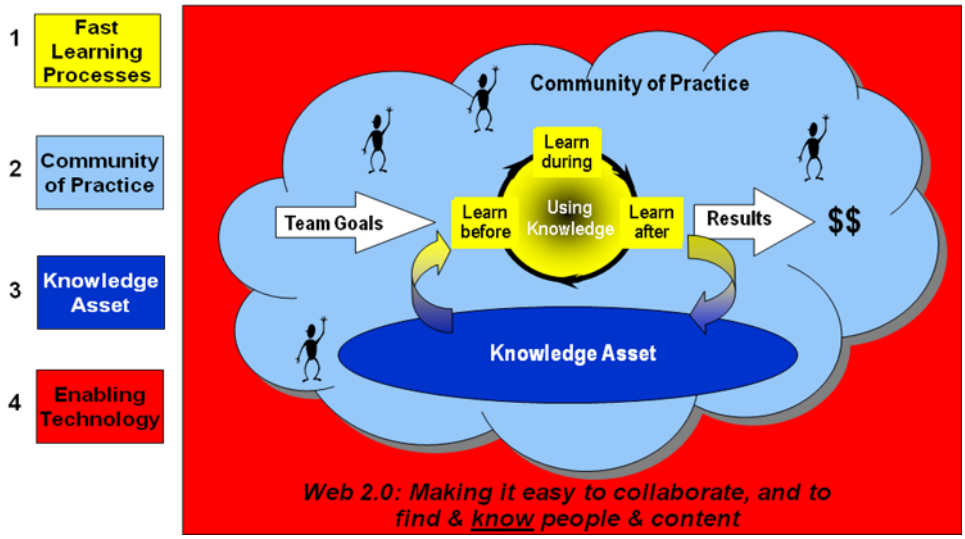


Figure 4.0: Integrated Elements of PE's Lessons Learned Framework

Fast Learning Processes

These processes are used by teams to explicitly learn before, during and after their work tasks. Together, they provide a common approach to organizational learning, predicated on identifying, capturing and then reusing practical business knowledge. These learning techniques will help the VHA's Product Effectiveness Program to operationalize lessons learned, reduce mistakes and rework, and add discipline and structure to sharing lessons from the development and purchase of IT products for the VHA. This will result in increased effectiveness of VHA information technology products in a measurable and meaningful way.

Ultimately, the goal is to increase the effectiveness of VHA Information Technology by applying the Learning Before, During and After techniques and embedding the resulting key lessons in day-to-day decisions and operations. These three learning techniques are described as follows:

- **Peer Assist – Learning Before Doing.** A Peer Assist (PA) is a facilitated meeting or workshop in which peers from various business units or projects share their experience, insights, and knowledge with a team that has requested help. A Peer Assist targets a specific technical or business challenge of the 'home team,' before they have started implementing their plan. It facilitates learning from people inside and outside the team, and identifies possible improvements to their current plan and approach. A Peer Assist also fosters the development of strong networks and often prompts the formation of communities of practice within the organization and beyond. For example, A Peer Assist can be implemented at the beginning stages of a new, complex IT project. Members of the new project team and their peers from previous teams−perhaps even from outside VHA−share their knowledge and insights in order to better define requirements, develop more

effective and efficient plans, and ensure a higher probability of success. A Peer Assist can also be implemented when a team has identified an upcoming challenge, and where knowledge from peers could add value.

- **Action Review – Learning While Doing.** An Action Review (AR) is a quick and simple facilitated discussion held immediately after the completion of a sub-task or specific step in an ongoing activity. An Action Review requires only 15 minutes and can aid in quickly identifying lessons for both the team and individuals to incorporate into the work flow during the execution of the next step or task. Action Reviews are very effective in improving performance on-the-job because they build trust and confidence among team members. For example, lessons learned that emerge from Action Reviews during IT Project milestone reviews can be *immediately* embedded into the remaining project execution phases to improve forward performance. In addition, Action Reviews can add significant value during the execution of each Phases of the Functional Review process: Project Inception; Concept Development; System Design; System Development & Testing; and System Deployment.
- **Retrospect – Learning After Doing.** A Retrospect (RS) is a facilitated team session called after the completion of a major project, milestone, or work flow. The objective of the Retrospect is to capture the team's new knowledge and create action plans to embed that new knowledge into the next project plan, process, management, and delivery of the product, resulting in faster production cycle times and improved product quality. One of the reasons the Retrospect is so effective is that it not only identifies what worked or didn't, but also analyzes why and provides actionable advice for the future. As an example, a Retrospect can be conducted at the end of the Functional Review process, at the end of System deployment/implementation, or any other major milestone. Lessons learned and best practices discovered during a Retrospect can be codified and applied to inform and improve VHA's end-to-end requirements process and traceability.

The Learning Before, During and After techniques follow a project life cycle. During the early or planning stages, one or more Peer Assist(s) can be conducted to improve the team's plan and vet ideas and lessons learned from peers/experts. During the execution of activities, Action Reviews are conducted to learn in the moment and improve a team's performance while they are still delivering on their project tasks and work activities. At the conclusion of a project, phase, or milestone, a Retrospect is conducted to build and capture lessons for the future and embed them into the next process going forward. Figure 5.0 demonstrates the application of the Learning Before, During and After events with a typical project life cycle. Appendices 3, 4, and 5 outline the steps involved in executing each of these learning techniques.

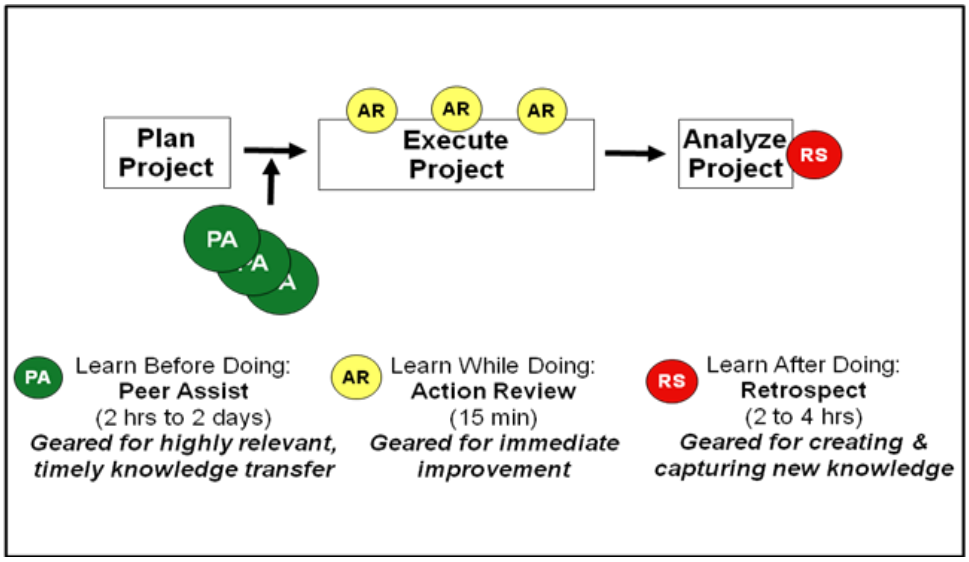


Figure 5.0: Learning Processes and Project Life Cycle

The Peer Assist, Action Review, and Retrospect processes focus on the following:

- Learning from individuals who have significant experience and knowledge in the business area.
- Sharing the experiences and insights gained through the business area activities.
- Interpreting them in the context of the problems at hand to create *new learnings*.
- Employing lessons learned techniques to reflect on the events that transpire throughout the execution of the project as activities are performed to accelerate the learning process while the project is being done.
- Reflecting on how the results compared with those expected when the project, or activities within the project, is/are completed to generate a conscious and explicit understanding of what took place during the project, to learn after doing. These learnings are examined from a key learnings and advice perspective to provide actionable insights to future "mission critical" operations.
- Capturing these learnings and codifying them into a reusable knowledge repository (Knowledge Asset) accessible to the target audience online.

The bottom line is these processes improve performance by making learning explicit and routine. When in place and supported, learning and leveraging the collective know-how and experience in the organization is no longer left to chance or serendipity.

Trends discovered through PE's analysis of Action Reviews and Retrospects across multiple projects may inform and influence VHA Enterprise policies, procedures, and decision-making.

Communities of Practice

In KM, the concept of tacit knowledge refers to that knowledge which is only known by an individual and that is difficult to communicate to the rest of an organization. Knowledge that is easy to communicate, and therefore codified, is called explicit knowledge. Explicit knowledge is typically found in books, videos, white papers, databases, etc.

Tacit knowledge, or expertise, is knowledge that people carry in their minds and is often difficult to express.[7] We know more than we can tell others, and people are often not aware of how they know something, or that what they know is valuable to others. Therefore, it should be no surprise that expertise and experience is not easily shared or transferred without significant effort by both the source and receiver.

Tacit knowledge is also considered more valuable because it contains context for people, places, ideas, and experiences. Effective transfer of tacit knowledge generally requires extensive personal contact and trust because it is found in the *experience* of the people in an organization and in the *interactions* between members of the organization.

One of the most effective enablers for sharing and transferring tacit knowledge is a Community of Practice (CoP). A CoP is a group of individuals:

- Who come together to share experiences and learn from each other.
- Whose collective action significantly impacts organizational and individual performance.
- Who identify themselves as members of the community.
- Whose ongoing interaction provides a sense of identity for their members and a mechanism for mentoring and personal development.
- Whose interaction is expected to last while it serves their common purpose and enhances their relationships.
- Who engage in regular and, often, ad-hoc activities such as meetings, discussions, conversations and other interactions.

CoPs facilitate the exchange of knowledge by providing a context for communication based on shared interest and practice, regardless of organizational and geographical boundaries. This facilitates collaboration between people within the organization who might not otherwise have the opportunity to share knowledge and information. Additionally, CoPs instill a level of trust between its members, which enables sharing of ideas and emergent thinking, some of which may be notional and novel, and therefore not yet suitable for discussing in more formal environments.

[7] "Tacit Knowing", Michael Polani

A CoP is often established as part of an overall knowledge strategy linked to a business imperative. They can emerge in the field where the work is done, or be initiated and encouraged by superiors. Either way, when CoPs focus their attention on the practices their members use to perform their work, significant improvements typically result. When guided and facilitated effectively, they positively impact execution of an organization's mission. In this case, they would be aimed at increasing the effectiveness of developing, deploying, and applying VHA Information Technology products. As shown in Figure 6.0, forming Communities of Practice around VHA IT product development, purchase, and implementation will encourage valuable knowledge transfer and reuse. CoPs will allow members at all stages of competency to "ask the practitioners and experts" for advice and guidance on key issues. For a further discussion on Communities of Practice, please see Appendix 6.

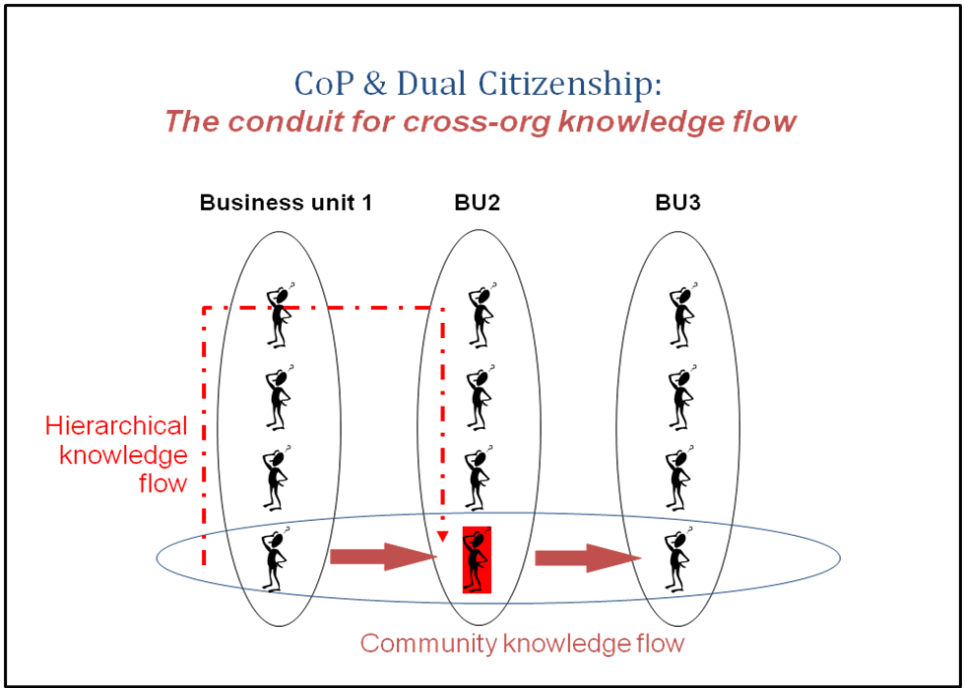


Figure 6.0: Community Knowledge Flow

Knowledge Asset

Over time, leveraging Learning Processes and Communities of Practice over several IT projects will result in recurring patterns, or themes, of learning. Some of these patterns will be a technique, method, process, activity, incentive or reward that is more effective at delivering a particular outcome than any other. These types of patterns define a Best Practice. Best Practices can also be defined as the most efficient (least amount of effort) and effective (best results) way of accomplishing a task based on repeatable procedures that have proven themselves over time for large numbers of people.

Every industry and organization has good practices. Some have even developed Best Practices. However, not all of their Best Practices are explicit, or those that are explicit do not accurately or sufficiently describe the practice in a way that others can reproduce it. Therefore, it is imperative to find and share Best Practices in an effective manner across the organization and then to routinely monitor and refine them as necessary. In fact, some organizations refer to effective or recommended practices as 'next' practices because they don't want their people to rest on their laurels.

A key component of PE's KM methodology is developing a content rich, needs driven knowledge repository (body of knowledge shared via a community portal) that contains focused knowledge in the form of re-usable lessons learned and best practices. Such a repository is called a Knowledge Asset. Components of a well-developed Knowledge Asset include:

- The business context in which the learning occurred.
- Codified lessons learned and best practices, and associated insights in the form of FAQs, guidelines, checklists, and stories of their use.
- Guidance on what needs to be addressed at each stage of the process where the knowledge is typically used.
- Links to people who have the experience to contribute, and if established, a Community of Practice whose members manage, validate, and renew the asset content.
- A reference library of documents that might save you time.
- Feedback from the end user of the knowledge to keep it relevant and alive.

Think of the end users as the customers for the knowledge stored in the asset. The Knowledge Asset must be focused on what the end user needs to know. Its content must be ***packaged*** with the end-user in mind to maximize the reuse of the relevant knowledge in the organization. Building an effective KA is a complex task for it to be both sustainable and effective. However, the value it provides makes its development and maintenance a very worthwhile effort.

An effective Knowledge Asset must also include linkages to practitioners and key experts associated with the practice. These are the people best positioned and informed to provide the content of a knowledge asset and keep it renewed with the latest learning from the field. These experts can explain their practices and articulate any areas for improvement, or identify differences between their practice and the practices of others who operate in similar industries and organizations. These experts must have the appropriate background as it relates to their practice, and they should be held in high regard by others in their organization and especially within their area of practice. Often these experts can be located by asking others who they contact for technical or practice-specific advice.

Once identified, these experts can be used as technical gatekeepers to help disseminate and refine, as necessary, the Knowledge Assets that are relevant to their CoP. The organization can encourage the participation of these individuals by legitimizing their

role in this capacity by formal and public acknowledgement and by offering some incentive. Additionally, these individuals will likely have an internal motivation for contributing to the organization's collective intelligence in this way.

Schneider Electric, a €17.3 billion energy management company, uses a Best Practice guideline for the development of Knowledge Assets[8]. The roots of this Best Practice come from British Petroleum and several other companies that adopted and adapted BP's original approach. In developing the relevant content for a Knowledge Asset, there are proven guidelines one should follow:

- **Is this knowledge based on real experience and, if so, where is it documented or who has it?** The powerful combination of practical experience explaining what was done and why it was done increases the probability of reuse – the ultimate goal.
- **Is the knowledge meaningful to someone besides the source***?* The simple question, "So what?" is a simple but powerful question to answer before content is added to the repository. If the answer is compelling then the knowledge is added to the repository. Such a simple process keeps the repository vibrant, relevant and avoids the problem of the knowledge repository becoming just another information storage area.
- **If someone reads or listens to this knowledge can it make a difference?** Are there insights or advice on critical organizational needs contained in what has been captured or offered up as content? Again the focus is on relevance and reusability to the widest possible audience. Finally, there is a validation step with existing CoP members. Does the knowledge stand out to someone who makes it his or her business to deal with the issue at hand?

Building an effective repository is a complex task for it to be both sustainable and effective. The key point is that building a Knowledge Asset is a process[9] that takes some level of effort, and that should follow these guiding principles:

- The Knowledge Asset must be designed so that it is intuitive for the end user to navigate. Lessons learned and best practices should be easily accessible and transferable.
- The content of the Knowledge Asset must be relevant to the end user, and should be rich in context and experience. It must be validated by users, and refreshed as appropriate to ensure the most current knowledge is always available.
- The existence of the Knowledge Asset should be advertised via a communications plan. This plan should illustrate the potential of the knowledge reuse.

Knowledge Asset creation relies heavily on interviews and learning events to generate content for the asset. However, content for the KA may also come from more informal collection channels such as analysis of Wiki and/or Blog content.

[8] From Richard B Wallace, Chief Learning Officer of Schneider Electric.
[9] The Knowledge Asset development process will be described in detail in the LL Policies and Procedures document, which is under development.

Enabling Technology

Each of the first three integrated elements of the KM methodology−Fast Learning Processes, Communities of Practice, and Knowledge Assets−depend on leveraging technology to ensure successful implementation.

In support of the Fast Learning Processes, many of the facilitated face-to-face engagements will be executed either with standard facilitator materials such as easels, whiteboards, and marker pens, or with the use of electronic decision support tools such as Think Tank™. Think Tank™ allows participants to freely express themselves on networked laptop computers where the inputs are anonymous. In addition, participants can share their learnings and insights simultaneously, which significantly increases the effectiveness and efficiency of idea generation with the group. Everything captured in Think Tank™ is automatically converted into a MS Word document at the end of the session. This, in turn, facilitates the sharing of the meeting results to the participants and others that need to know.

Sometimes, it may be difficult to gather participants for a face-to-face Peer Assist, Action Review, or Retrospect. In these instances, the PE Team can leverage several technologies to conduct synchronous (same-time, different-place) & asynchronous (different-time, different-place) virtual meetings: Teleconference, Think Tank, web surveys, and web-based presentation tools such as LiveMeeting and WebEx.

Technology also plays an important role in supporting Communities of Practice and Knowledge Assets. Platforms such as Microsoft SharePoint, Tomoye, and others provide a web site (Portal) that ensures people and their collective knowledge are secure, yet highly visible and easily accessible. Effective KM portals provide the following:[10]

- Security - single, unified logon
- Personalization – customizable environment via mashups, subscriptions, etc.
- Collaboration – User interaction and communication
- Application integration – Universal access
- Categorization – Browse and discover
- Openness – Platform and application independence
- Scalability – Growth capability

Delivering the content to the targeted audience in a highly personalized manner is a key to having a successful portal.[11] Please refer to Appendix 9 for a description of a successful KM portal: Air Force Knowledge Now (AFKN).

Numerous KM processes and systems are available that facilitate the transfer and dissemination of knowledge, as shown in Figure 7.0. Some of these processes and systems are particularly effective at disseminating and transferring specific knowledge

[10] Source: Gartner Group
[11] Source: Gartner Group

within the same context, whereas others are better at transferring more complex knowledge within different contexts. *The point is that no one process or system provides a one-size-fits-all solution. Rather, a blended approach tailored to fit the culture and platforms of a particular organization is typically needed for a KM approach to be successful.*

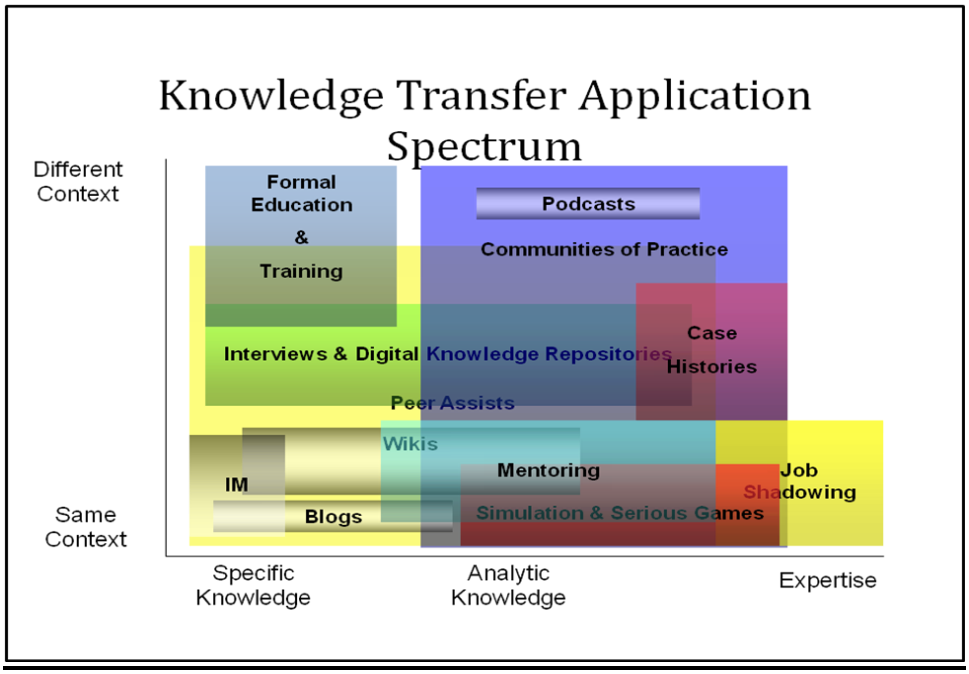


Figure 7.0: Knowledge Transfer Application Spectrum

Within the context of VHA's KM methodology, the Lessons Learned Program will leverage existing VHA IT infrastructure in order to support Learning Processes, Communities of Practice, and Knowledge Assets. This existing infrastructure includes Microsoft Sharepoint and MySite, which collectively provide document management, collaboration, Wiki and Blog capabilities. For a further discussion of the technology requirements associated with VHA's KM methodology, please see the "Lessons Learned Program Evaluation and Analysis of IT Solutions for a Lessons Learned Repository" document. A case study of how technology can be used to strengthen collaboration and knowledge transfer is included in Appendix 8.

X. Overall Approach for Lessons Learned

This section provides an overview of the steps that are used to execute a LL project. LL projects will fall into one of three categories: 1) Direct LL customer engagements; 2) Other PE domain engagements (CS, BR, and FR); and 3) Internal PE/LL. A brief description of each of these engagement categories, and the process steps associated with each, is outlined below.

Direct LL Customer Engagements

The LL Domain within PE engages with VHA customers directly, much like Customer Satisfaction, Benefits Realization, and Functional Review. A good example of a potential direct LL customer engagement is CIS/ARK deployment at VISNs nation-wide. The deployment of CIS/ARK within a VISN is a complex undertaking, requiring the coordination of technical and non-technical elements, as well as multiple perspectives from one facility to the next. There are many opportunities to learn from successes and failures, and to shape that learning into guidance for other facilities as well as other VISNs. Transferring that guidance into execution will result in increased effectiveness and efficiency as CIS/ARK is deployed from one facility to the next within a VISN, and from one VISN to another.

Following are the steps the PE/LL project team uses to identify, and execute, direct LL customer engagements:

- *Identify Projects.* The PE/LL team identifies and selects VHA IT products and services for inclusion in the LL program. Section XII describes the criteria that is used for selecting among the potential products and services. Products are evaluated against established criteria and added into a "pipeline" of potential LL projects. These products can be added into the LL program's portfolio based on user feedback (Remedy tickets, NSRs, etc.), suggestions from ESMs or IDMC/HISEB, research conducted by the LL project team, or as scheduled follow up LL engagements as necessary. Based on these identified products/services, the LL team prioritizes them and develops an annual plan of which LL engagements are pursued and when. OHI leadership approves the plan annually, and meets with the LL team on a quarterly basis to review and adjust the plan as necessary, based on any emerging needs or pressing issues.
- *Create the Project Charter*. Once the IT product/service has been selected, the PE/LL team develops an initial project charter that documents the primary goal(s) of the LL project. This document is signed by the key stakeholders of the IT product/service being examined, including OHI and product leadership and the members of the respective Steering Committee. The charter may be revised as the team learns more and is better able to understand and articulate the specific goals for the LL engagement. The project charter plays an important role in formulating the tactical approach for conducting the LL

engagement, and is useful in building consensus and buy-in across the cross-functional teams. The project charter also communicates the expected time commitment for each of the key stakeholders working on behalf of the specific LL project.

- *Establish a Cross-functional Steering Committee.* This committee is created to give strategic guidance, provide approval when necessary, and resolve project issues that have escalated to the Steering Committee. At a minimum, the Steering Committee should be comprised of the LL leadership that will chair the committee and the VHA business owner for the IT product/service being examined. The committee may also include additional individuals, as specified in the project charter. The composition of this committee varies based on the IT product being assessed. Using the example of CIS/ARK, a Steering Committee would be invaluable to ensure the LL project team has access to the facilities and personnel needed for successful project execution, providing guidance on national roll-out schedules and implementation issues, and minimizing the impact of organizational 'detours' that arise that are beyond the control of the LL project team.
- *Form a Working Group of VHA Users.* This group should be comprised of a small subset of key users of the IT product/service being engaged, and may include relevant subject matter experts and opinion leaders. The group works with the PE/LL team throughout the entire project, and is consulted during key steps in the project. This group's substantive involvement is critical to the success of the project. Unlike the Steering Committee, the working group should be comprised entirely of product/service end users and should provide more guidance based on the LL engagement population. Depending on the IT product/service being engaged, it is possible that one/some members of the Steering Committee will also participate in the working group of VHA users. Using the example of CIS/ARK, members of the LL project working group for VISN 21 might include the VISN 21 project manager, and the lead clinical manager at each of the VISN 21 facilities. Using such a working group will be invaluable to ensure the LL project is properly coordinated with all the facilities within a VISN, that the facilities understand their roles and responsibilities in LL project execution, and that issues and concerns are surfaced and handled consistently throughout the VISN.
- *Customize KM Process and Create Stakeholder Alignment.* The PE/LL project team evaluates each of the LL methodology techniques (Fast Learning Processes, Communities of Practice, Knowledge Assets, and Enabling Technology) against the requirements of the LL project. Pros and cons are determined for each technique, and consideration is given to using a combination of techniques to ensure the LL project is harvesting the appropriate lessons in a reasonable amount of time and with minimal disruption to the product/service users. For some projects, simple Retrospects and/or Peer Assists are all that is required. For complex projects that span several VHA organizational entities over time, such as CIS/ARK deployment, all the LL techniques are applied in a holistic approach. An example of how

all these elements have been woven together for CIS/ARK is shown in Figure 10 of Appendix 1. The PE/LL team refines the project approach, as necessary, based on feedback from the Working Group.

- *Identify LL Project Risks.* The PE/LL team, in conjunction with the Steering Committee and Working Group, identifies potential risks associated with the execution of the LL project. The PE/LL project team also identifies actions to minimize the probability of those risks occurring (avoiding actions), as well as actions to minimize the impact of those risks if they do occur (contingent actions).
- *Build the LL Project Plan.* The PE/LL project team builds a detailed MS Project plan that illustrates all elements of the LL project, to include major milestones, actions, timelines, and required resources. This plan is presented to the Steering Committee and Working Group. The PE/LL project team refines the plan, as necessary, based on feedback from the Steering Committee and Working Group.
- *Generate and Capture Learning and Experience.* This is where the tangible work begins to elicit and harvest operational knowledge. The majority of knowledge generation and capture is performed through a series of individual interviews and the facilitation of on-the-job team learning processes before, during, and after major work activities. The following sub-bullets summarize the processes that can be used to complete this phase of the project:
    - *Conduct Peer Assists.* The PE/LL team begins by researching if other similar projects have already been conducted within the VHA, as well as identifying any industry best practices that may exist. If the PE/LL team finds that other similar projects have been conducted within the VHA, members of the PE/LL team identify the key players of those projects and interviews them to identify lessons learned and artifacts that may be helpful. The PE/LL team collects and organizes useful information gathered from interviews and industry best practices and packages that information into a Wiki/Blog site dedicated to that LL project. The PE/LL team makes that site available to the project working group and schedules and conducts a Peer Assist. The PE/LL team invites members of the project Working Group, as well any VHA peers or outside experts that are available and willing to engage in a facilitated dialogue to help the project team get off to the best start possible. As part of the Peer Assist, the PE/LL team also reviews plans for the LL engagement, and teaches Working Group members how to conduct Action Reviews to capture lessons throughout their execution of the project. In addition, the PE/LL team orients the Working Group members on how to use the Wiki/Blog to collaborate with each other (instead of relying on email), and how to capture the results of their Action Reviews and any other relevant information and artifacts, such as checklists, guidelines, etc. Although the preferred format for a Peer Assist is a face-to-face meeting among the participants, the PE/LL team recognizes that gathering participants

together in one place may be difficult, and can conduct virtual Peer Assists, as necessary. The PE/LL team packages and posts results of a Peer Assist onto the project Wiki/Blog.

- *Conduct Action Reviews.* The Working Group and their team members conduct action Reviews as they deploy the IT product/service. The PE/LL team's role is simply to train these members on how to conduct Action Reviews and how to post the results of those reviews into the project Wiki/Blog.
- *Monitor Wiki/Blog.* The PE/LL team monitors the Wiki/Blog and encourages its use by the Working Group and the product deployment teams (Vista programmers, IT support staff, etc.). As part of its monitoring activity, the PE/LL team reviews Wiki/Blog entries and identifies common themes related to lessons learned and areas requiring further clarity. These common themes are validated in the conduct of Retrospects at the end of major project milestones (e.g., completion of CIS/ARK rollout at a specific facility) and at the end of the project itself (e.g., VISN 21 rollout of CIS/ARK). Areas requiring further clarity are addressed in Retrospects and interviews, as necessary.
- *Conduct Retrospects.* The PE/LL team designs and facilitates Retrospects at the conclusion of any major project milestone, as well as at the conclusion of the project itself. The objective of the Retrospect is to capture the team's new knowledge and to create action plans to embed that new knowledge into the next project plan, process, management, and delivery of the product, resulting in faster cycle times and improved product quality. One of the reasons the Retrospect is so effective is that it not only identifies what did or didn't work, but it also analyzes the reasons and provides actionable advice (lessons learned) for the future. For example, the results of the Retrospect will provide advice for the next facility scheduled to deploy CIS/ARK within that VISN. The PE/LL team will distill the results of Retrospects into meaningful and transferable lessons learned, and will post these results into the project Wiki/Blog. The PE/LL team will package and post results of a Peer Assist onto the project Wiki/Blog. Although the preferred format for a Retrospect is a face-to-face meeting among the participants, the PE/LL team recognizes that gathering participants together in one place may be difficult and can conduct virtual Retrospects, as necessary.
- *Conduct Additional Peer Assists, as Needed.* In the context of a complex LL project such as CIS/ARK rollout, a Peer Assist can be conducted at the VISN level to ensure the best possible start for that VISN as it begins its deployment effort. However, as that VISN deploys CIS/ARK from one facility to the next, there is a need to ensure the transfer of lessons learned between the first facility and the second facility, and so on. The PE/LL team can conduct a virtual Peer

Assist between a facility that has completed its deployment, and another facility that is about to begin its deployment of an IT product. The PE/LL team reviews the results of the Retrospect conducted with the facility that just completed its deployment with the facility that is next in line. In addition, the PE/LL team reviews the Wiki/Blog project site, and reminds that facility's Working Group member (who participated in the original VISN Peer Assist) about Action Reviews and capturing lessons and artifacts in the Wiki/Blog.

- *Build Knowledge Asset.* As the results of Peer Assists, Interviews, and Retrospects are compiled for the LL project, the PE/LL team can begin to assemble and populate a Web page linked to the PE SharePoint site. This Web page is dedicated to the LL project (e.g., CIS/ARK deployment), and is updated continuously as additional lessons are learned from interviews and Retrospects during the life of the LL project. The PE/LL team conducts analysis to validate lessons before posting to the Knowledge Asset. As other facilities within a VISN begin deployment of the IT product, the PE/LL team makes that deployment team aware of and provides access to the Knowledge Asset so that it can benefit from the knowledge contained therein. The Knowledge Asset should include the following information:
    - A summary of the context in which the learning occurred.
    - Key learnings and insights in the form of FAQs, guidelines, checklists, best practices, and stories – both local (specific to a facility) and common (across many facilities).
    - Guidance on what needs to be addressed at each stage of the deployment process.
    - Links to people who have experience to contribute.
    - A reference library of helpful documents.
    - A network (Community of Practice) to manage, validate, and renew the Knowledge Asset.
    - Feedback from the end user to keep it relevant and alive.
- *Establish and Leverage Communities of Practice.* As the deployment of an IT product is completed from one facility to the next and from one VISN to another, it is important to establish a CoP so that people with experience in that IT product can stay connected to each other, regardless of geographical boundaries. Using the Community Development Process described in Appendix 6, the PE/LL team can establish and define a Community of Practice by identifying a leader, core group members, and developing a charter (roles and participation, processes, tools, procedures, governance). The CoP should be focused on the Knowledge Asset built for that IT product, and its members should contribute by sharing additional insights, helping other CoP members as they deploy the system, and by providing suggestions to the PE/LL team on improvements to the KA. The PE/LL team provides a trained facilitator to support the CoP.
    - *Leverage Existing Technologies*. Recognizing that people adopt new ideas, processes, and modes of operation at different levels and at

different times, an important component of KM is "meeting customers where they are." As such, the PE/LL team has created an alternative to formal CoPs that adopts a strategy that utilizes some of the potentially powerful CoP technologies without specifically calling it a CoP. Known as a 'Yam Jam,' it is a live, text-based event where facilitators use existing Yammer applications to drive conversation around specific topics. The event provides an opportunity for attendees to actively participate in multiple parallel conversations around different components of a designated subject as their interest draws them. Following the event, participant input is captured and mined. Adopting this strategy is a way to sustain momentum and energy around the concept of active dialogue and knowledge sharing without force-feeding a more structured framework represented by communities of practice. In essence, this is an exploratory activity designed to draw out people with a strong interest in collectively learning from others while increasing their understanding of new and important technologies, processes, or products. As a repeatable process, Yam Jams frequently set the stage for communities of practice.

- *Communicate LL Project Results.* The LL team assembles results from interviews, Peer Assists, Action Reviews, and Retrospects and distills them into meaningful lessons that are of value to others. The PE/LL team makes these results available via several mechanisms: 1) A Knowledge Asset (as described above) where the validated lessons are easily accessible and searchable by any VHA employee; 2) Management reports that summarize key findings and recommendations of interest to VHA leadership; and 3) Presentations to an appropriate audience of predefined and approved stakeholders. The Steering Committee and Working Group provide guidance on specific stakeholders that could benefit from the lessons learned from the project, and the PE/LL team should be proactive in disseminating these lessons via the mechanisms described above. Section XI of this document articulates other communication mechanisms the PE/LL team can use.
- *Self-Assessment.* After every LL engagement, the LL team conducts a self-assessment via a Retrospect. The purpose of this Retrospect is to identify what worked well, what didn't work as planned, and what changes, if any should be incorporated in future LL engagements and updated into the LL CONOPs.

Other PE Domain Engagements

Each of the other PE domains (Functional Reviews, Benefits Realization, and Customer Satisfaction) has its own direct customer engagements. The CONOPs for each of these domains states that in the conduct of their engagements, they are to capture lessons learned and publish those in their final reports.

Following are the steps the PE/LL domain uses, as appropriate, to support the other PE domains in their efforts to identify and communicate lessons learned from their direct customer engagements:

- Setup a Wiki/Blog to allow the FR, BR, or CS project-specific teams to collaborate and share lessons learned in real-time during project execution.
- Review deliverable documents from a LL perspective to identify areas requiring further clarification by the PE domain responsible for the engagement, as well as to identify specific lessons that should be shared with other PE domains and/or other PE stakeholders. The PE/LL team can publish its findings in a written report and share those findings with the appropriate stakeholders.

Internal PE Lessons Learned

The CONOPs for each of the PE domains states that they are to conduct a self-assessment at the conclusion of each direct customer engagement. The purpose of the self-assessment is to identify opportunities for improvement in how each domain executes its work. However, a self-assessment by an individual PE domain is insufficient, as it is also important to examine PE as an organization in order to identify opportunities for improvement.

Following are the steps the PE/LL domain can use, as appropriate, to support internal PE lessons learned:

- Allocate space on the PE SharePoint site to capture and share lessons learned by domain, as well as for PE as an organization.
- As appropriate, conduct a Retrospect at the conclusion of every direct customer engagement to support the self-assessment efforts of each domain involved in that effort. If multiple domains are involved on a project, the Retrospect can also target opportunities for the domains to work together more effectively and efficiently. The PE/LL team distills the results of the Retrospect into actionable lessons learned and publishes the results in a document that is posted to the PE SharePoint site.
- Conduct quarterly or bi-annual Retrospects for the PE organization to identify opportunities for improving the effectiveness and efficiency of the organization as a whole.

XI. Communication of Results

A critical step in designing the Lessons Learned program is the establishment of an effective process and vehicle for communicating the results of Lessons Learned engagements. The act of harvesting lessons learned is only valuable if those lessons can be shared and *transferred* to the appropriate parties to aid in performance improvement and decision-making. Specific to this end, the LL team:

- Establishes consensus with the Steering Committee, before starting a LL engagement, on the goal(s) for the LL engagement.
- Designs the LL engagement with the goal of harvesting and transferring lessons that improve performance and aid decision making.
- Leverages Peer Assists in order to transfer lessons learned from those who learned them to those with similar challenges, before they begin implementation.
- Leverages Communities of Practice in order to share, analyze, and transfer lessons learned across VHA in real time.
- Gathers and analyzes results of Peer Assists, Action Reviews, Retrospects, and Interviews during a LL engagement. Distills key findings and lessons that can be used to build Knowledge Assets. Communicates the availability of Knowledge Assets to the VHA community.

- Throughout an LL engagement, identifies and analyzes results of Peer Assists, Action Reviews, Retrospects, and Interviews for lessons that should be communicated to VHA leadership. Creates and shares LL engagement interim reports on any such relevant lessons.
- Includes a description of the processes used to conduct the LL engagement in the Final Report, the context surrounding the engagements, the stakeholders directly involved in the engagement, the composition of the Steering Committee, and the LL User Working Group supporting the project, etc.
- If available, includes relevant lessons learned information from previous engagements and compares these with lessons discovered during the current engagement. This often provides important insight around which previous lessons are actually being "learned" or "re-learned," and/or reflect recurring problems and challenges.

Since the depth and breadth of Lessons Learned engagements vary for each product and each assessment, there is not a standard template that is applied to all Final Reports. However, the process for developing all Final Reports is similar, with the report being reviewed by OHI leadership and the project sponsor before being widely distributed. The Chief Officer of OHI reviews the initial Final Report and determines the validity and impact of the information gathered. If appropriate, the report is shared with the product's relevant stakeholder(s), and an action plan is developed to address relevant issues. This action plan is then included as a "management response" within the final report, and the entire document is presented to the LL engagement Steering Committee.

Once the LL engagement team has delivered the Final Report, its official involvement is complete, with the possible exception of support to Communities of Practice that originated as a result of the project and which continue to thrive. It is the assigned project sponsor's responsibility to design an action plan that incorporates the results of the LL engagement. This sponsor could be a business owner for the system, an ESM, a member of the IDMC/HISEB, or anyone that has responsibility for making IT product decisions for VHA.

XII. Criteria for Selecting Lessons Learned Projects

In order to leverage KM, organizations must first identify specific opportunities, or projects, where KM methods and lessons learned can add value. Many organizations, including British Petroleum, the Defense Intelligence Agency, the US Army, the Central Intelligence Agency, Frito Lay, and others have successfully used a set of criteria to help identify, vet, and select KM opportunities. These criteria are shown below in Figure 8.0.

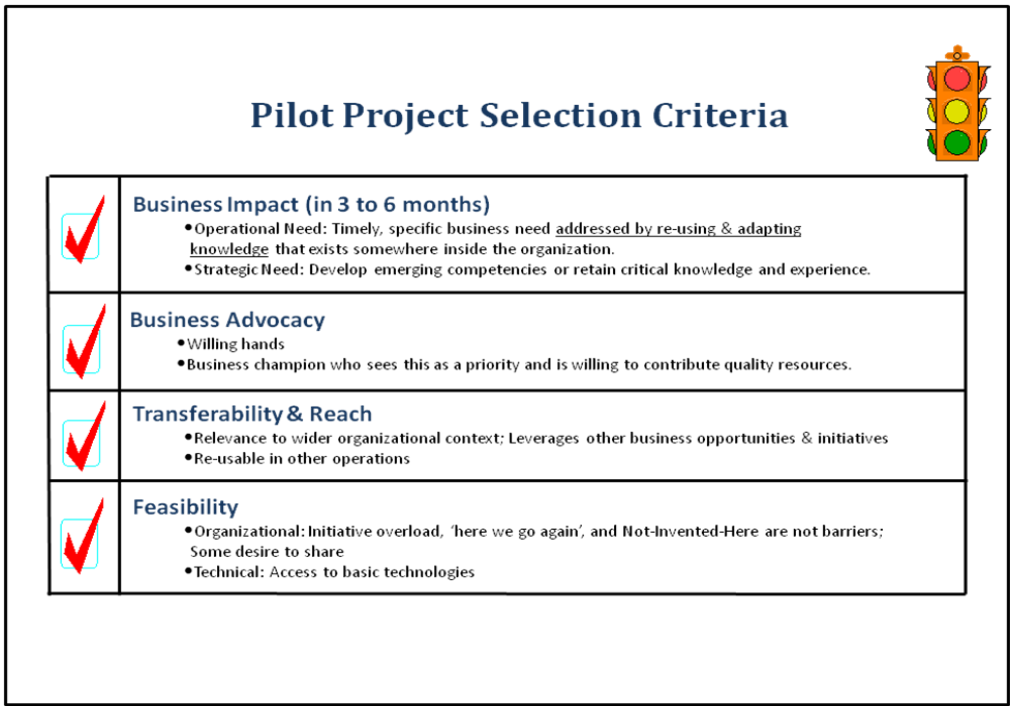


Figure 8.0: Pilot Project Selection Criteria

These criteria are applied in an iterative fashion through conversations and engagements with key stakeholders and primary customers. A brief summary of each criterion follows:

- **Business Impact:** This criterion is used to assess the potential improvement that could be gained by sharing, transferring and applying lessons learned. Some questions that help make this assessment include:
  - What are some business activities that you perform over and over (repeatable business processes)?
  - Do some of these require major improvements to meet your business targets this year? Why?
  - If you were to improve in one of these areas, what difference would it make? Big enough to make others stand up and take notice?

  - In what areas might some new or additional lessons learned contribute to the improvement?
  - Do you have a gut feel that relevant lessons learned in this area exist somewhere else in the organization?
- **Business Advocacy:** This criterion is used to describe and express the level of commitment by the sponsor of the Lessons Learned project. It's also important to assess the advocacy of the people who may be the potential sources and receivers of lessons learned.
- **Transferability and Reach:** This criterion is used to describe and assess the range and breadth of impact of the LL project across the organization. It is important to identify the business units and/or teams that can potentially benefit from the project.
- **Feasibility:** This criterion is perhaps one of the most important. It is used to identify and assess the organizational and technical enablers and barriers that will likely impact the successful sharing and transfer of lessons learned in the project. To do this effectively, the LL program will need to make the following clarifications:
  - The level of commonality of the Business process, impacted by the project, among the potential sources and adopters. This includes commonality of key performance metrics.
  - The level and extent to which performance measurement data exist for the key metrics. These will be used to measure, value and validate the LL transferred and applied.
  - The technical issues that could impact transfer of LL. These include technology requirements, process requirements such as complexity of practice, adaptation requirements, and the cycle time to apply and assess the impact of LL on the business challenge or problem it is intended to improve.
  - The organizational issues that could affect transfer. These typically include behaviors such as openness and 'not invented here,' as well as time and space available in the targeted client organization to learn and apply the knowledge they gain. An important characteristic to watch out for is the level of 'initiative overload' in the target organization. Frequently, those inclined to invest in LL are the early adopters, and they may have several other initiatives underway.

XIII. Define Roles & Responsibilities

Phase & Task	PE Director	Integration Manager	Domain Lead	LL Team	Customer
Program Management					
Update Comprehensive Pipeline List of Products/Services within the LL Program	C	C	A,R	R	
Prioritize Backlog of Products/Services for the LL Engagement and Document in the Annual Plan - Review Quarterly	A,R	C	R	R	
Select and Approve Specific Products/Services to Engage for LL	A,R	I	C	C	I
Manage Resources Against the Annual Plan – Conduct Gap Analysis to Identify New Requirements	C	I	A,R	C	C
Coordinate with PE Integration Team and other PE Domains	C	C	A,R	R	
PHASE 1.0 – Create Engagement – Due Diligence					
1.1 – New Customer					
Perform Exploratory Research to Identify Potential LL Projects	C	C	A,R	R	C
Conduct Initial Analysis of Existing Lessons	I	I	A,R	R	
Meet with Potential Customers to Introduce the LL Program and Explore Objectives	A	R	R	R	R
Gather Project Information and Conduct Due Diligence	C	C	A,R	R	C
Determine Alignment of Lessons Learned Products and Services with Customer's Project (Align with Phased Development Approach, Phased Rollout/Timeline, for Example)	I	I	A,R	R	C
Coordinate with PE Integration Team and other PE Domains	C	C	A,R	R	
Develop Initial Lessons Learned Products from Enterprise Lessons and Research	I	I	A,R	R	C

PHASE & TASK	PE DIRECTOR	INTEGRATION MANAGER	DOMAIN LEAD	LL TEAM	CUSTOMER
Develop Initial Draft Engagement Project Charter	C	R	A,R	R	C
1.2 – Existing Customer					
Identify Additional LL Projects	C	C	A,R	R	C
Conduct Initial Analysis of Existing Lessons	I	I	A,R	R	
Meet with Potential Customers to Propose Additional Services	C	I	A,R	R	R
Gather Project Information and Conduct Due Diligence	C	C	A,R	R	C
Coordinate with PE Integration Team and other PE Domains	C	C	A,R	R	
Update Lessons Learned Products from Enterprise Lessons and Research	I	I	A,R	R	C
Develop Initial Draft Engagement Project Charter Addendum	C	R	A,R	R	C
1.3 – Enterprise					
Identify Relevant Lessons Learned from BR, CS, and FR Engagements	I	I	A,R	R	C
Identify Relevant Lessons Learned from LL Engagements	I	I	A,R	R	C
Identify Relevant Lessons Learned from Research	I	I	A,R	R	C
Conduct Initial Analysis of Existing Lessons	I	I	A,R	R	
Develop Initial Lessons Learned Products from Enterprise Lessons and Research	I	I	A,R	R	C
Update Enterprise Knowledgebase	I	I	A,R	R	
PHASE 2.0 – Catalog Lessons Learned Categories					
Explore Customer Portfolios for LL Data Mining Sources and Research Targets	C	R	R	A,R	C
Compile and Document CS, BR, and FR Domain-related Requirements to Guide Strategic Focus	I	I	C	A,R	C
Identify Prospective Audiences	C	C	R	AR	C
Conduct Initial Trend Analysis from Previous Engagements for Potential Applicability	C	C	R	AR	C

PHASE & TASK	PE DIRECTOR	INTEGRATION MANAGER	DOMAIN LEAD	LL TEAM	CUSTOMER
Select a Set of General Categories, e.g., PMO Functions, Training, Requirements, Communications	C	I	A,R	R	C
Update Categories in Enterprise Knowledgebase	I	I	A,R	R	
PHASE 3.0 – Plan LL Engagement					
3.1 – Develop Execution Strategy					
Brainstorm Business Impact, Business Advocacy, Transferability and Reach, Feasibility	C	C	R	A,R	C
Scope Phases for Engagement Execution	C	C	R	A,R	C
Identify Subject Focus Areas per Phase	C	C	R	A,R	R
Identify Internal and External Research Venues	C	I	R	A,R	C
Identify LL Capture Events	I	C	R	A,R	R
Identify Knowledge Asset and Community of Practice (CoP) Requirements	I	C	R	A,R	R
Determine Needed Knowledge Base Data Content and Plan Associated Customer Products	C	I	A,R	R	R
Identify LL Disseminators and Receivers	C	I	A,R	R	R
Create an Overarching Strategy Framework for the Engagement	C	C	A,R	R	I
Analyze Strategy for Potential PE Integration	C	R	A,R	R	
Document Strategic Framework	C	I	A,R	R	C
3.2 – Create Engagement Project Plan					
Draft Initial Project Charter for LL Engagement and Obtain Customer, PE, and other Stakeholder Signatures	C	C	A,R	R	R
Obtain Support/Sponsorship from Key Stakeholders	R	C	A,R	R	C
Gather Information on System/Service to be Engaged	I	I	R	A,R	I
Establish Project Steering Committee	C	C	A,R	R	I

PHASE & TASK	PE DIRECTOR	INTEGRATION MANAGER	DOMAIN LEAD	LL TEAM	CUSTOMER
Establish Working Group of Key Users	I	I	A,R	R	C
Customize Knowledge Management Process and Create Stakeholder Alignment	I	I	R	A,R	C
Identify LL Project Risks and Analyze Mitigating Strategies	C	C	R	A,R	C
Revise Project Charter Based on Additional Information Collected	C	C	R	A,R	C
PHASE 4.0 – Execute LL Engagement					
Conduct Research	I	I	R	A,R	R
Conduct LL Interviews	I	I	R	A,R	R
Conduct LL Facilitated Sessions (Peer Assists)	I	I	R	A,R	R
Train Deployment Teams on Conduct of Action Reviews	I	I	R	A,R	R
Conduct LL Facilitated Sessions (Action Reviews)	I	I	C	C	A,R
Conduct LL Facilitated Sessions (Retrospects)	I	I	R	A,R	R
Setup Web Sites (e.g., Sharepoint/Wiki/Blog) for Project Stakeholders	I	I	R	A,R	R
Monitor Contents of Project Web Site	I	I	R	A,R	C
Conduct Follow-on Interviews and Retrospects Based on Monitoring Wiki/Blog	I	I	R	A,R	R
Develop and Sustain a Knowledge Asset to Ensure Lessons Learned are Available and Searchable	I	I	R	A,R	R
Develop and Sustain a CoP, as Appropriate; Conduct Yam Jams to Encourage Open Dialogue and Knowledge Sharing	I	I	R	A,R	R
Develop and Sustain the *Journal of Lessons Learned*, as Appropriate					
Analyze Data – Throughout Engagement Lifecycle					
Analyze Results of Research, Interviews, Peer Assists and Retrospects; Distill them Across Lessons Learned Categories, Domain Needs, Enterprise Lessons, Customer Needs, and Product Specific Lessons	C	C	R	A,R	C

Phase & Task	PE Director	Integration Manager	Domain Lead	LL Team	Customer
Identify Lessons Applicable to Other Entities (Enterprise LLs for OHI Leadership, Other Customers)	C	C	R	A,R	C
Develop Customer Recommendations and Prepare Summary Reports from Research, Interviews, Peer Assists, Action Reviews, and Retrospects	C	C	R	A,R	C
Develop Leadership Recommendations and Prepare Summary Reports from Interviews, Peer Assists, Action Reviews, and Retrospects, and Prior Research	C	C	R	A,R	C
Update Enterprise Knowledgebase	I	I	A,R	R	
Communicate & Disseminate Lessons Learned – Throughout Engagement Lifecycle					
Develop Communication Products, such as Reports, Presentations, Newsletters, Website/Knowledge Asset Content, Session Summaries, the *Journal of Lessons Learned*	C	C	R	A,R	C
Disseminate and Communicate LL Results via Communications Products to Customer Groups, OHI Leadership, Steering Committee and Product Sponsor, and Other Relevant Stakeholders	C	C	A,R	R	I
Facilitate VISN-to-VISN or Team-to-Team transfer of LL Results via Peer Assists or Briefings	C	C	A,R	R	I
Facilitate Delivery and use of Customer Web Sites to Collect and Share Lessons Learned	C	C	A,R	R	I
PHASE 5.0 – Conduct Lessons Learned for a PE/LL Engagement (Lessons Learned Self-Assessment)					
Conduct Lessons Learned Retrospective	C	C	A,R	R	C
Develop Lessons Learned Report and Retrospective Findings	C	C	A,R	C	C
Update LL Program Documentation (CONOPs, P&P, R&R etc.)	C	C	A,R	R	
Perform Engagement Self-Assessment	C	C	A,R	C	C
Develop Self-Assessment Reports and Program Improvements	C	C	A,R	C	C

Phase & Task	PE Director	Integration Manager	Domain Lead	LL Team	Customer
Develop & Sustain Communities of Practice (CoP)					
Engage the Customer – Clarify Business Imperatives; Identify Enablers and Barriers	I	I	R	A,R	R
Plan the CoP – Identify Potential Members; Define Requirements for Technology Platform; Develop Tracking and Measurement Processes	I	I	R	A,R	R
Form the CoP – Train Core Members; Validate Focus Areas; Test and Implement CoP Technology	I	I	R	A,R	R
Launch the CoP – Conduct Facilitated Virtual Meetings; Initiate Tracking and Measurement	I	I	R	A,R	R
Grow and Sustain the CoP Across Multiple Project Stakeholders – Grow Transfer of Better Practices; Track and Communicate Progress and Value; Hold Monthly Exchanges via Teleconference	I	I	R	A,R	R
Support Self-Assessments for PE Domains					
Review documents from FR, CS, and BR domains	C	C	A,R	R	
Support self-assessment of FR, CS, and BR domains	C	C	A,R	R	C
Support self-assessment of PE organization	C	C	A,R	R	C
Develop Assessment Reports and Recommendations	C	C	A,R	R	C

XIV. Program Risks and Mitigation Strategies

There are many elements that make VHA a challenging environment within which to collect and disseminate lessons learned information, including: the size of the organization and the number of organizational entities; the number of IT products and processes; the number of existing SOPs and standing procedures; and organizational constraints that can make it difficult to affect change.

Additional challenges include:

- Timely access to both sources and receivers of LL
- Measuring the value of KM
- Establishing and nurturing communities of practice
- Determining what knowledge to share
- Protecting intellectual property
- Security

Despite these challenges, the value of this information should be significant because of the magnitude of the VHA's IT product investment and prioritization decisions, the potential to identify and learn from internal best practices across products and regions, and the ability to help communicate and align the end user needs with the IT priorities.

RISK: Within VHA, no culture or infrastructure present that creates the demand for the lessons learned information.
MITIGATION: Create demand by citing the goals of the Government Performance and Results Act (1993) and the Clinger-Cohen Act (1996) and describe how the LL program can address these requirements. Also, communicate the benefits of the program to the decision makers within the affected VHA and ESM organization so that they understand how the information will help them achieve their particular mission.

RISK: The LL data is effectively collected, analyzed, and disseminated but the time horizon associated with the resulting action is not taken or the planned action takes so much time to implement that stakeholders lose patience. The credibility of the program will suffer as a result. Stakeholders who participated previously may not be as inclined to participate in the future unless they think their lessons are being applied and adding value.
MITIGATION: Allow visibility to the process of input, analysis and dissemination so that interested parties can understand the extent to which their input is being evaluated and the value they have added to the process.

RISK: Organizational culture and discipline does not promote and support knowledge sharing, boundary-less collaboration, and innovation.
MITIGATION: LL Team develops a LL awareness briefing for leaders to share with their teams. Leadership continuously emphasizes and encourages the need to share knowledge and sustain people-to-people connections and recognizes those that do.

Knowledge sharers (sources) share their success stories. Knowledge sharing is written into employee Performance Objectives.

RISK: Technological barriers which create limitations on collaboration and knowledge sharing.
MITIGATION: New technology and security assessments must include, and appropriately consider, knowledge sharing impacts during analyses to minimize the creation of inadvertent barriers and limitations.

RISK: Resources necessary to execute knowledge sharing principles and organizational development are limited.
MITIGATION: Clarify and focus resources on prioritized projects that target specific performance improvements that develop and demonstrate enterprise-wide knowledge-sharing capabilities that maximize return on investment and desired effects.

RISK: Lessons learned submitted to the LL Program do not accurately reflect the true learning that occurred on a project.
MITIGATION: Clarify who the sources of knowledge are on a project, harvest lessons learned from those sources, and validate the lessons learned before publishing or disseminating summary reports.

RISK: Resistance to change surfaces, thereby impacting the success of the LL project.
MITIGATION: Senior leaders create the demand for change by leading by example and communicating the importance of the LL project to the VHA. Reward those that contribute by recognizing their efforts in a meaningful manner.

In summary, the LL Program has established a formal Knowledge Management (KM) methodology that enables the capture, distillation, sharing, and transfer of lessons learned regarding VHA IT products and services. The LL program methodology provides the foundation for Continuous Process Improvement (CPI) within PE as well as within OIT's development and procurement of IT products. The LL program will contribute to increased effectiveness of VHA IT products by providing decision makers with valuable knowledge from previous and on-going IT product development and procurement efforts. This knowledge will support evidence-based decision making at all levels of VHA by providing guidance for future IT investments.

Appendix 1 – Lessons Learned Process Diagram

Section IX of this CONOPs describes each of the pillars of the KM methodology used by the LL program: 1) Fast Learning Processes; 2) Communities of Practice; 3) Knowledge Assets; and 4) Enabling Technology. Each of these four pillars can be seen as stand-alone product lines of the LL domain. For example, some LL program customers may simply want one of the following services:

- Assistance with assessing and organizing technology platforms (Yammer, for example) to support a more collaborative work environment for their teams.
- A facilitator to design and execute a Retrospect to gather lessons learned for a recently completed project, or at the conclusion of a significant milestone.
- A facilitator to design and execute a Peer Assist to help their team address a specific challenge before beginning to execute a project.
- A facilitator to train a project team on how to conduct Action Reviews in order to gather lessons learned throughout project execution.
- A facilitator to help develop and sustain a Community of Practice for a specific product/service.
- A facilitator to help develop a Knowledge Asset for a specific product/service.

Although these specific, stand-alone services add significant value for the customers of the LL domain and the VHA enterprise, even greater value is realized when these pillars are integrated into a holistic approach in support of a LL engagement. Figure 9 illustrates how all the pieces of the KM methodology work together. The LL domain understands that not all LL engagements will require all four elements of the KM methodology; some engagements may require all 4 core elements, while others may require a subset. For example, in support of the other PE domain projects (Functional Reviews, Benefits Realization, and Customer Satisfaction), it is expected that the LL domain may provide the following services:

- Conduct Retrospects at the conclusion of significant project milestones.
- Distill the key insights from those Retrospects into actionable lessons learned.
- Review deliverable documents from a LL perspective to identify areas requiring further clarification, as well as to identify specific lessons that should be shared with other PE domains and/or other PE stakeholders.
- Setup a technology platform (Blog or Wiki) to allow the FR, BR, or CS project-specific teams to collaborate and share lessons learned in real-time during project execution.

Another example, the deployment of Anesthesia Record Keeping (ARK) systems across all VISNs, is particularly complex and expected to require ***all*** elements of the LL domain methodology. Figure 10 depicts how the elements of the LL program could be integrated to support this important and complex project.

The point here is the LL program's approach to an engagement will be tailored to the requirements of that engagement. While it is unrealistic to identify all possible tailored approaches in this CONOPs, Figures 9.0 and 10 depict how all the methodology elements integrate holistically, and how a the LL program might approach a particularly large and complex project, respectively. The specific actions required to conduct the steps illustrated in Figures 9.0 and 10 will be described in the LL Policies and Procedures document, which is under development.

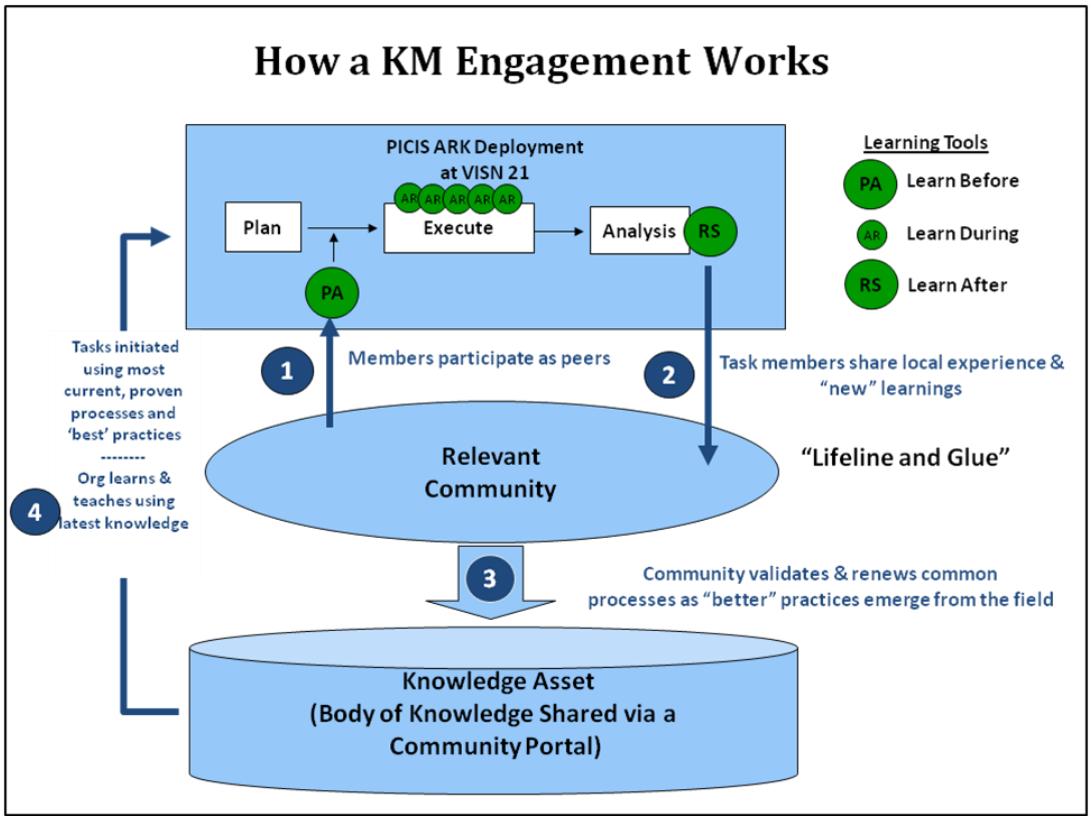
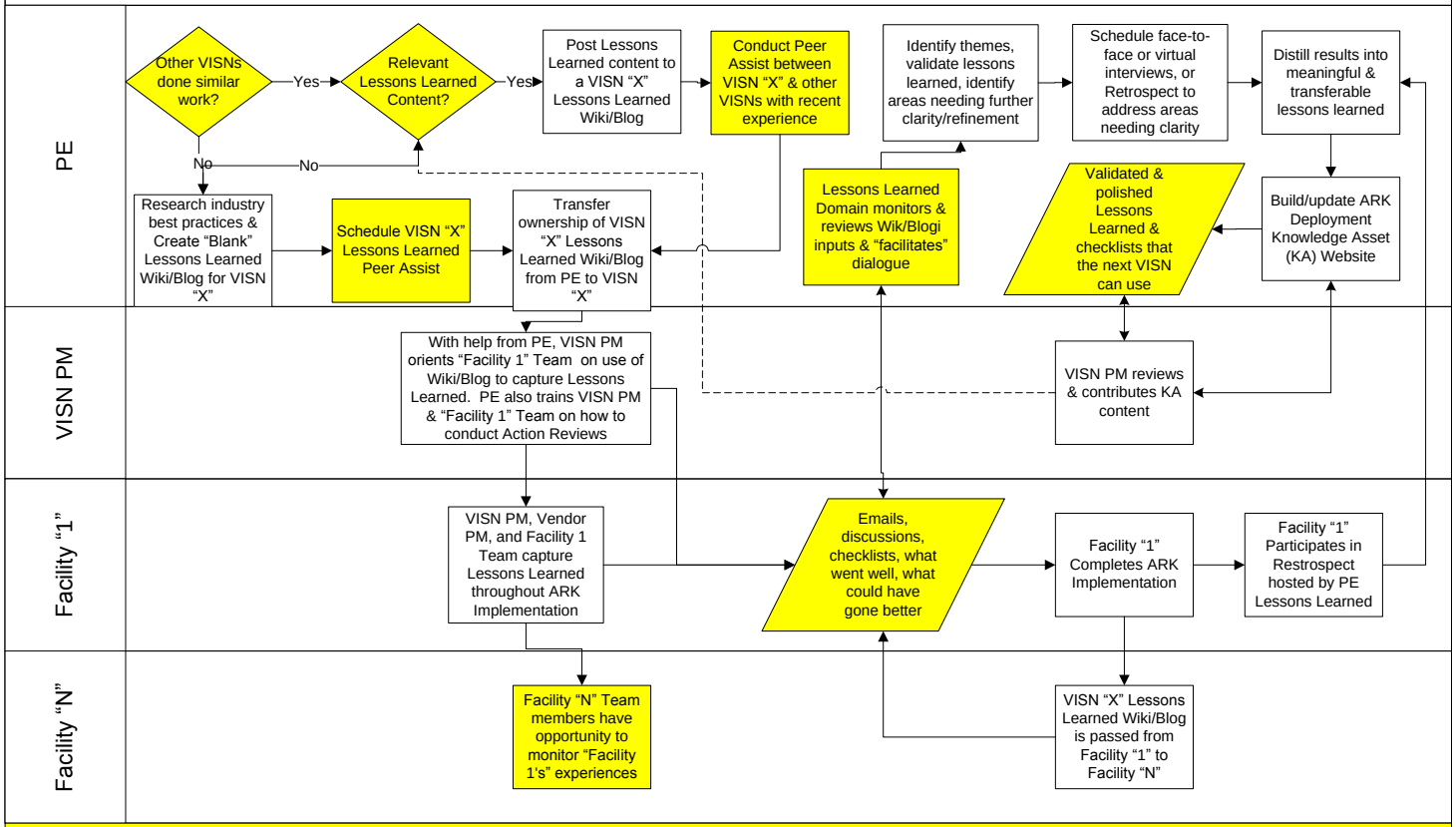


Figure 9.0: How a KM Engagement Works

Figure 10: Notional CIS/ARK Engagement Process for VISN "X"



Sources of Knowledge & Lessons Learned: VISN "X" members *as well as* members from all other VISNs that have, or are undergoing, the same or related work. Using the CoP Development Program outlined in Appendix 7, the PE LL Team develops and sustains an ARK CoP to connect people across all VISNs.

Appendix 2 − Lessons Learned Operational Scenario

The scenario below is presented to describe a future state for the PE Lesson Learned Program. It is not intended to describe all the policies and procedures associated with the program, but rather how the program would interact with customers at a high level. This story assumes that the VHA has already established a LL Repository & Community of Practice (CoP) capability.

The Cast:

Judy is a 5y Veteran of the VHA. She is a registered nurse and project manager helping to deploy a capability that will help VHA hospitals better manage their Anesthesia Record Keeping. She lives in Florida, but often travels cross country to different locations where the system is being deployed. She works with teams from the VA's Integrated Service Network (VISN), as well as with the vendor that designed and develops the system. Judy uses a blog to write about her experiences as well as the things she cares about. Judy carries a Blackberry that allows her to receive emails and access the Internet.

Anne works for ABC software. ABC is the vendor selected to provide this capability. She is a project manager within the company's professional services group. She's been assigned to help Judy deploy the system at VHA.

John is a new Project Manager within the VHA. He has been hired as a project manager to help in the deployment of the new anesthesia recordkeeping system.

Stan is the KM Facilitator at PE's Center for Lessons Learned. His job is to help introduce and embed a proven LL process, which includes establishing effective Communities of Practice within the VHA to better leverage and share knowledge across practitioners in the hospital operations environment.

Bill is the Executive Assistant (EA) to the Chief Information Officer (CIO) at the Department of Veterans Affairs. In this capacity, he helps the CIO stay aware of new programs and initiatives. Although not directly involved with the implementation, the CIO cares deeply about how well the VA deploys new systems and capabilities across its network of hospitals. In the past the VA has had difficulty in consistently deploying large complex systems.

The Scenario:

As the Project Manager for the first deployment of the system, Judy has an enormous amount to learn. She's deployed similar systems but never with such complexity. At this point it looks like the system is going to provide the VHA with a great capability. Even before the first deployment begins, many other sites start aggressively planning to deploy

the system in their hospitals.

As a member of the VHA Project Manager Community of Practice, Judy has ready access to other people involved in the deployment of the new capability and a PM Lessons Learned repository. The community platform is designed to help people in similar role groups (e.g. Project Managers) share information and lessons learned. Before jumping into her new assignment, she begins a period of discovery, looking to identify a formal Knowledge Asset on ARK implementation or any other reusable content from other similar experiences within the VHA. Specifically, she's looking for deployment artifacts she can re-use to make her job easier and more consistent - hopefully reducing the number of mistakes she makes. Some of what she finds using the Search capability of the repository is useful - a high-level project plan, a high-level communication plan, and a list of deliverables. Judy knows there are people out there with relevant experience she can learn from, but unfortunately, she doesn't find anything related to this new system. Needless to say, she's going to be breaking some new ground with this project.

Using the platform's messaging system, Judy sends a message to all the community members, "Hi Everyone, Judy here - I've been assigned as the PM on the new Anesthesia Record Keeping system, I've found some useful things to reuse in our repository but it looks like we don't have a formal Knowledge Asset with deployment checklists, guidelines, and other insights related to this new system. As I learn new things, I'll be forwarding project emails into the repository as well as trying to write in my blog. As you uncover relevant documents and learn from your personal experience and those of others, I hope you, too, will share this knowledge with our community. Together, we can learn as we go about how best to enhance this capability for VHA."

Judy also does some Internet searches using Google. She finds an interesting Case Study from a private hospital that deployed the same system last year. The case study has some interesting tidbits that might help Judy at the VHA. Judy quickly creates a bookmark for the case study - this 'social' bookmarking capability is a part of the VHA's Community platform. She tags the bookmark using the term 'ARK' and 'Case Study' - these tags will help others find and read this case study link. They will also help people connect with one another to share their insights and experience in ways that documents just can’t. She saves the bookmark.

Stan, the KM Facilitator in the PM CoP notices Judy's message. He sends her an email letting her know he's set up a new site and document library within the system. The site is dedicated to the new system Judy is working on. The library has been configured to receive emails from the PM CoP members - the library will be assigned its own email address. The KM Facilitator also sends an email out to the rest of the PM CoP letting them know a new site and document library has been created to support the new system. Stan helps members discover new information by adding three new feeds to the site's home page:

1. Really Simple Syndication (RSS) feed from Ruth's blog
2. RSS feed from the systems search capability using a ARK query term
3. RSS feed from the bookmarking system using tag 'ARK'.

Stan also sets up an Alert for himself in the repository so he'll get an email anytime anything new is added to the repository. In this way, he can act as a broker to facilitate connections and conversations between community members. Finally, Stan offers to assist Judy in further researching available content and SMEs that can help Judy jump-start her project, and offers to setup and facilitate a Peer Assist (face-to-face or virtual) with Judy and other PM's that may have some insight to share. Stan is intent on ensuring Judy has the best footing possible as she starts her new journey.

As Stan creates the new site, its name shows up in a list of 'New Sites' on the main page of the community platform. It's here that Bill, the CIO's EA sees it and subscribes to the sites' RSS feeds. Bill drops Stan a quick message letting him know he's subscribed and that the CIO could be 'looking in' on the program occasionally. Whereas in most organizations this might be threatening (e.g. inviting micromanagement) the CIO's been working hard to build a culture of knowledge sharing. Stan's excited at the opportunity to get some high level visibility to Judy's work. The lessons that come out of the ARK project could dramatically help the VA deploy similar systems.

As a result of the Peer Assist hosted by PE's Center for Lessons Learned, Judy learns a lot from her peers and has gained significant insight on how to address some of the specific challenges related to ARK deployment. Practical insights gained from her peers has led to significant changes in her original deployment plans. Furthermore, July learns that Ann, her counterpart in the vendor organization, is willing to share a deployment checklist with her. Unfortunately this checklist is a bit dated and was created in support of a private hospital and much of it doesn't relate to VHA hospitals. There is, however, enough structure in the artifact to build upon and tailor it to how the VHA does business. Judy knows about the aggressive plans for follow-on deployments and also knows that a VHA specific checklist and other insights could be very helpful. Judy emails the document as well as some descriptive info into the new repository created by Stan, and in her descriptive info, she 'nominates' this raw content as the initial seed for the development of an ARK knowledge asset for VHA.

As a complex system, ARK requires a lot of planning work within and amongst the facilities within a VISN (culture, process, and communications challenges, to name a few), as well as configuration issues and the enabling IT infrastructure. It seems like every setting in the system has implications that are not yet fully understood, and that every day brings new challenges in team dynamics, supporting IT infrastructure, and VHA-wide cultural issues. That night as Judy returns home, she's had some time to think about some of the challenges associated with deploying this new system. She decides this is a perfect kind of thing to share on her blog and sets about writing a new post entitled - "Implementing ARK - the good, the bad & the ugly". This is only one of many postings Judy plans to make on this complex topic. As she leads the ARK

implementation, Judy also gathers timely insights from her implementation team through Action Reviews (introduced to Judy by PE's Center for Lessons Learned), and posts those insights on her blog.

Stan receives the alert triggered by Judy's earlier email into the repository. After looking at her email and attachment, Stan copies the attachment into a 'Knowledge Assets Under Development' section of the repository. He creates a link from the new location to Judy's email to provide 'traceability' back to the original raw content. Stan monitors Judy's blog over several days/weeks, and as Ruth's team completes ARK implementation at the first facility, Stan schedules a facilitated Retrospect with Judy and her Team that is designed to reflect back on their experiences thus far and identify critical lessons learned across the full range of their experiences. This knowledge is captured and used to further populate the knowledge asset with highly-relevant, VHA specific information and experience that can be reused and adapted by other teams deploying ARK.

Stan invites Judy, Judy's Team, and Ann to the face-to-face (preferable) or virtual Retrospect (if too difficult to gather folks together geographically). During the Retrospect, the group shares their insights, creates some new knowledge generated from a combination of their individual learning, edits the checklist directly from the repository, and creates any other useful artifacts to populate the knowledge asset. They save the asset, creating a new version while retaining the earlier version. The result is a great first draft of an ARK knowledge asset, which includes deployment checklists, key insights, links to other useful information, and links to people with knowledge others may want to contact. Stan sends a message out to all the PM CoP - notifying them of the new knowledge asset.

Stan receives an email from John's new boss - requesting John be added as a member of the PM CoP. Stan adds John to the CoP platform and gives him member permissions to the PM CoP. The system sends John an email notifying him that he's been added as a new member of the PM CoP. During John's new employee orientation, he is 'issued' his own blog and receives training on the PM CoP capability. Stan also sends an email out to all the members of the CoP welcoming and acknowledging John's new arrival. Although busy, Judy sees the email and wonders if John will be a part of the follow-on deployments.

After orientation, John's supervisor calls to let him know he's been assigned as a new PM on the second deployment of the new ARK system. Not knowing anything about the ARK system, John accesses the PM CoP and does a Search on ARK. He finds the new site created by Stan and sees the RSS feeds - one from Judy's Case Study bookmark as well as Judy's "...The good, the bad & the ugly" blog post. His search also turns up Judy's email along with raw checklist as well as Stan's 'New Knowledge Asset' notification. John quickly realizes Judy is a 'Subject Matter Expert' (SME) - he comments on her blog post, introducing himself and thanking her for taking the time to document the challenges of implementing the new ARK system. As John explores the new ARK Knowledge Asset, he realizes it contains a wealth of information that will

make his job a lot easier, and that will ensure a more effective and efficient deployment for his team, thanks to the hard-earned knowledge gained by Judy and her team.

Stan schedules a Peer Assist event to connect Judy's team experiences with John's new assignment. Stan facilitates the event using a Peer Assist outline. Stan highlights both the raw knowledge and new assets published and under development. Judy and her team describe their experiences with John and his team. Stan records the event using an audio and video recorder to make sure no knowledge is left un-captured. Afterwards, Stan transcribes the discussion and posts it into the ARK site. After reading the transcription, Stan sees enough content to form the genesis of a 'Configuration Guide'. Stan connects with Judy and seeks her sponsorship for this Knowledge Asset development effort. Judy agrees to sponsor the effort. Stan schedules an event with Judy, Ann and John to help build out this asset.

John begins his deployment effort, which has been accelerated up the learning and performing curve as a result of the Knowledge Asset, Community of Practice, and Peer Assist efforts.

Appendix 3 − Learning Before: The Peer Assist

Following is a guideline for how to conduct a Peer Assist. This guideline was developed by the KM Team at BP:

What is a Peer Assist?
A Peer Assist is a facilitated meeting or workshop where peers from different teams share their experience, insights, and knowledge with a team that has requested help in meeting an upcoming challenge or problem.

A Peer Assist:

- Targets a specific technical, mission or business challenge.
- Gains assistance and insight from people outside your team and identifies possible approaches and new lines of inquiry.
- Promotes sharing of learning with each other and develops strong, and often new, connections among staff.

Why it Works
People are much more inclined to use knowledge and insights from other peers before they undertake a project or challenge. The key to a successful Peer Assist is to convene the session after a team has exhausted their internal knowledge, have created their plan, and before the start of actual implementation.

Who Can Help You Learn Before Doing?

- Tap your personal network to find who might have experience in the subject area and the particular challenges you are facing. Ask people you trust who they know that might have useful knowledge to share and contact them.
- Search your company intranet for people with the skills and relevant experience that can help you.
- Contact people in relevant communities of practice or professional forums and ask for their help or contacts.
- Consider announcing your intent to do a Peer Assist by posting the subject on your company's intranet electronic news/announcements facility.

When is a Peer Assist Appropriate?
A Peer Assist is appropriate when:

- The cost of gathering help leverages significant potential business benefits.
- A business unit is facing a challenge about which others may be able to offer experience and insight.
- The diversity of views external to the group can broaden the range of options considered.

How to Go About It

- Define the problem or opportunity that you are trying to help.
- Consider whether a Peer Assist is the most appropriate process.
- Write a Terms of Reference and identify the skills and experience that may help.
- Look for diversity in the people who will help your team confront the problem from different perspectives (people with little direct experience can often offer a great deal of new challenge).
- As early as possible, identify people who can participate on your selected dates−you want people who have the most relevant experience to share, so fitting in their schedules is critical.
- Identify an experienced facilitator who understands the learning process.
- Design the event to ensure plenty of time to reflect.
- Allow the Peer Assist team time on their own during the session to analyze their findings.
- Ensure the key learning and good practices shared during the session are captured. This may require some follow-up work to gather sufficient detail to make the information useful to those who did not participate.
- Agree to a set of actions.
- Make sure you consider whether someone else can benefit from the learning; make it accessible.

A Peer Assist should be carried out in an atmosphere of help and support. Sometimes a host team already knows what they need to do and is looking for validation. In these cases, they will still learn something new that impacts their intended plan and approach, but only if the facilitator gets them to truly listen and consider new possibilities.

How to Hold an Effective Peer Assist

- Plan the Peer Assist early, so the help you receive can aid in delivering your business outcome. (This is not just a step in the approval process; a Peer Assist is very effective in the planning and delivery stages, too)
- Share your plans for a Peer Assist with others by sharing the intent and design of your team/project learning event with those who may have similar needs.
- Clearly articulate the business problem or challenge for which you need help and the objective of the assist. (Be prepared for these to be reframed in the course of the assist.) Use briefing material to give the team context.
- Assemble a group with diverse skills and experience tailored to the objectives of the assist−people who will both challenge your mental models and offer options and new lines of inquiry. (Consider inviting people from other disciplines, businesses, and companies.)
- When participating as a peer in a Peer Assist, your role is to offer help, knowledge, and experience, and to reduce workload. Your role is not to criticize or add to the workload.
- Design the event with enough time to build the Peer Assist team−experience indicates two days are required to build the relationships necessary for an

effective team to address a significant problem or challenge. Contention will raise the level of dialogue and this will not occur if the group is being polite or have not socialized enough to create the open environment needed to share their hard-earned, personal knowledge. If the problem or challenge is very specific and technical, a successful Peer Assist can be completed in a few hours with the right people.

- Recommend what the host team should stop doing and offer options, alternatives and suggestions on what else they could do.
- Prepare an action list at the end of the meeting. Ask the host team to keep participants informed of progress as it is made on the items listed.
- Have each participant consider what they have learned from the Peer Assist and how it will be applied.
- Explore the desire of participants to stay connected after the meeting−Peer Assist often kick-start new communities of practice.
- Consider who else might benefit from the lessons learned and share them. Provide contact names for follow-up discussions.

Appendix 4 − Learning While Doing: The Action Review

Following is a guideline for how to conduct an Action Review. This guideline was developed by the KM Team at BP:

What is an AR?
An Action Review (AR) is a quick and simple team learning process held while work is being performed, usually during a break in a process, activity or task. It is intended to help teams 'learn in the moment' as opposed to learning after a major project or activity has been completed. It was originally designed by the US Army and is based around just four simple questions:

1. What was supposed to happen?
2. What actually happened?
3. Why were there differences?
4. What can we learn and ***do different right now***?

An AR is designed to quickly identify key lessons and immediate actions for both the team and individuals, and to build relationships, trust and confidence among team members. All it takes to begin running an AR is a commitment to open discussion, a little time, and paper and pencil to record the results.

When to have an AR
Plan for the AR immediately after a natural break in any work activity. For example, after a proposal meeting with a customer or after an operations team has completed a work shift. The AR should fall within the time allotted for the event. It should not appear as an add-on or extra work. An AR should be carried out when:

- Memory is fresh and unvarnished.
- Participants are still available.
- Learning can be applied immediately.

The AR Process
The following four questions provide the framework for the AR discussion:

1. **What was supposed to happen?** Everyone shares their own understanding of what should have happened. This is often the most revealing part of the process. Unless the event had a clear, unambiguous, and well-communicated purpose and plan, it is likely that different members of the team each had a different understanding of what was actually supposed to happen.
2. **What actually happened?** Establish the facts about what actually happened (the ground truth). The ground truth is used to identify a problem, not a culprit. The ground truth is also the foundation for further analysis by the Lessons Learned domain.

3. **Why were there differences?** Comparing the plan to what actually happened is when the real learning begins. Successes and shortfalls are identified and discussed.
4. **What can we learn to do different right now?** Agree to create action plans to sustain successes and help remedy shortfalls immediately.

How to conduct an AR

- **Open Climate:** The key to successful ARs is open and frank discussion. The objective is to learn and fix the problem, not to blame. Accordingly, ARs are learning events, not critiques or evaluation events. This may require some demonstration by the leader of the team at the beginning of the discussion.
- **Facilitation:** Most importantly, the facilitator of an AR must ensure that the meeting is open and blame is not brought into the process. ARs are designed to reveal and address real issues and "learnings" surrounding a team event−what the US Army calls "Ground Truth." Therefore, it is important that the facilitator guide the conversation to the real and sometimes unspoken issues. The facilitator may be the team leader or an external observer. If external, he or she must be a respected practitioner in the processes of the event and should have been a close observer of the actual event as it unfolded. Lastly, the facilitator should make sure the process is quick and simple−an effective AR can be carried out in 15 to 30 minutes.
- **Participation:** For an AR to be a successful discussion, it is imperative that:
    - Only those involved in the event participate.
    - There are no spectators; everyone in attendance participates.
    - Everyone is on an equal footing in the learning process−no hierarchy.

Recording

Use a flip chart to record the team answers to each of the questions. Try to limit the amount of writing and content to one or two charts, which serves to keep the time for the session and the team focused on the one or two important areas for improvement and action.

Recording the key elements of an AR clarifies what happened and makes it possible to compare that to what was supposed to happen. It also facilitates the sharing of lessons learned and experiences within the team. The results of an AR provide useful learning and insight for others in the organization performing similar tasks and projects, but that is not its primary purpose. They key purpose of doing an AR is to help a team learn and quickly apply the learning in real time to improve their current performance.

Appendix 5 − Learning After: The Retrospect

Following is a guideline for how to conduct a Retrospect. This guideline was developed by the KM Team at BP:

What is a Retrospect?
A Retrospect is a team meeting called after the completion of a piece of work. The objective of a Retrospect is to capture the new knowledge of the team. The benefits of a Retrospect are:

- Identification of valuable lessons.
- Enhanced team openness and cooperation.
- Achievement of closure at the end of the project.

How to Hold an Effective Retrospect

1. **Plan the meeting**
    a. Don't try to conduct a Retrospect by e-mail; it needs to be a face-to-face round table or videoconference.
    b. Hold the meeting as soon as possible after the project ends, ideally within a couple of weeks−memories fade. If you wait too long, events become post-rationalized.
    c. The time set aside for the Retrospect will depend on the number of people involved and the duration and complexity of the project. A very small project (3-4 people, 2-4 months) can be covered in 60 minutes. A 10-person, 6-month project may need four or more hours. A complex alliance between several companies may need two days.
    d. Consider using audio to record the event. Although this will take extra effort, it will be a valuable source of knowledge for the future and will help provide details in the documentation phase. Using video can be very useful for capturing short video-clips of personal insights (knowledge 'nuggets') to publish and help transfer lessons to others. But, unless you are prepared to 'do it right' with skilled video production experts this should not be attempted. Special care should be taken to ensure videotaping doesn't hamper the open exchange of information and knowledge or disrupt the process.
2. **Invite the right people**
    a. The project leader needs to attend, as do the project customer and key members of the project team. It is often useful to invite potential customers for the learning (such as people starting similar projects), but their involvement must be managed in a very sensitive manner to ensure their presence doesn't reduce the open flow of knowledge by the team that performed the project.

b. Ask the project leader to schedule the meeting. He or she has the most ownership, knows who needs to attend, and may retain some influence with the project team.
c. In the call to attendees, announce that the purpose of the meeting is to make future projects run more smoothly by identifying the learning points from this project.

3. **Appoint a facilitator**
   a. You will need a facilitator who was not closely involved in the project; otherwise, the meeting will concentrate on "what we did" rather than "what should the next team do in similar circumstances." If the facilitator is very remote from the project, she or he may need to do some preparation (such as having discussions with key players).
   b. The facilitator needs to reiterate that the purpose of the meeting is to make future projects run more smoothly by identifying the learning points from this project. The purpose is not to assign blame or praise.
   c. The facilitator needs to encourage an atmosphere that allows participants the freedom to express opinions critical of anyone. If necessary, introduce "rules of the game." Particular care must be made to 'coach' the project team leader in advance of the session so that their participation doesn't influence the open exchange of knowledge.
4. **Revisit the project's objectives, deliverables, and measures**
   a. This is the point at which you ask, "What did we set out to do?" and "What did we really achieve?"
   b. The facilitator may want to ask the customer, "Did you get what you wanted?"
   c. It often helps to have the team leader list the objectives in advance and have them posted on a flipchart to use to prompt the team for input. If this approach is used, be sure to encourage the team to modify and add objectives as they understood them for the project. Any differences may point to key learning areas to prompt for later.
5. **Revisit the project plan, process and/or timeline**
   a. Some facilitators like to construct, with the team, a flow chart of what happened, identifying tasks, deliverables, and decision points. This way, you can identify those parts of the project that experienced delays, were completed ahead of time, were particularly efficient or inefficient, and where the team was unclear about what really occurred.
   b. You can then draw an idealized process: how it should have worked!
   c. Another approach is to construct a timeline that identifies key milestones, deliverables and events. This is used to help refresh the memory of the team and may point to key learning areas for further discussion in the following sections. If this approach is used, a good idea is to have the team leader build this in advance on flipchart paper (may take several sheets) and have it posted on the wall in the room for people to review and discuss. Leave space for people to add items that stood out for them.
6. **Next ask, "In the context of reaching the objective, what went well?"**

a. Always start with the good points! We want to build on best practice as much as we want to avoid repeat mistakes. It is best to start the meeting on a positive note.
b. Go around the table asking each individual what their success factors were.

7. **Find out why aspects of the project went well and express the learning as advice for the future**
    a. Identify the success factors, so they can be repeated in the future.
    b. Ask such questions as: "What repeatable, successful processes did we use?" "How can we ensure future projects go just as well or even better?" "Based on your success with this project, what would your advice be to future project teams?"
8. **Then ask, "What could have gone better?"**
    a. There are bound to be some areas where things could have gone better, where pitfalls were identified too late, and where process was suboptimal. Go around the table again and ask each individual. You may want to start with the team leader. If the team leader admits that things could have gone better, a good precedent has been set for others to speak openly.
9. **Find out what the difficulties were**
    a. The facilitator should ensure that this section of the process does not become a witch-hunt or a finger-pointing exercise. If necessary, remind the participants that the purpose of the meeting is not to assign blame, but to make sure similar projects go smoothly in the future. Think positively!
    b. Identify stumbling blocks and pitfalls, so they can be avoided in the future. The following questions are useful: "Given the information and knowledge we had at the time, what could we have done better?" "Given the information and knowledge we have now, what are we going to do differently in similar situations in the future to ensure success?" "Based on your experiences with this project, what would your advice be to future project teams?"
10. **Make sure the participants leave the meeting having had their feelings acknowledged**
    a. You do not want anyone to leave the meeting feeling that things were covered-up of that valuable effort was not acknowledged.
    b. To help you access residual feelings of dissatisfaction, begin by asking people for a numerical rating of the project. Ask, "On a scale of 1 to 10, how satisfied are you with this project?" You can then ask, "What would have made it a 10 for you?"
    c. This will often result in bringing some new information into the room from some of the team that didn't express their views previously. This may be source for follow-up and further discussion.
11. **Summarize the learning from the project in terms of "lessons for the future"**
    a. Meeting results are intended for teams running similar projects in the future.

b. Express the lessons as advice. Express them as clearly, measurably, and unambiguously as possible. Ask yourself, "If I were the next project leader, would these lessons be of any use to me?"
c. Make sure you circulate the lessons, together with any other outcome from the meeting. Ask participants to comment. Make sure no one is misquoted and that the facilitator's working of the lessons learned really reflects the views of the team.

12. Plan for Action (Optional)

a. Some teams will want to use the opportunity and findings from the session to do some action planning for the following:
    i. Address some of the lessons that emerged that are highly relevant to their team's on-going performance.
    ii. Pursue things they now want to do differently.
    iii. Further explore and analyze specific areas that went well, or could have been more effective, which were identified but time didn't allow for thorough discussion.
b. Capture the key actions in a simple table format on a flip chart: What, Who, and by When.

13. Record and publicize the lessons

a. Make sure that people looking for these lessons will be available to find and understand them, and that they know how to contact the people involved. Put the lessons on the organization's internal Intranet or portal and make them searchable. Make sure the context is explained and include links to the people who can explain the lessons and other relevant documents that others may find useful in helping to re-use or adapt the lessons.

Appendix 6 – Communities of Practice[12]_Yam Jams

Communities of Practice (CoPs) are one of the most effective organizational forms for sharing and transfer of a wide range of knowledge between people who share a common profession, practice area or domain. A CoP is a voluntary group of peers, practitioners, and other individuals whose members regularly engage in sharing and learning, based on common interests, to improve their individual performance, the performance of their teams, and the performance of their overall organization. They are typically drawn together by common work products and processes.

By their nature, CoPs cut across multiple generations. Many encourage membership of practitioners past, present, and future, which means the age of the members can vary widely. They are likely to include a higher proportion of novices and experts that get to know each other more quickly than you would normally find in a typical group within an organization. As a result, they are a natural market for mentorship and provide a safe environment for mentees to ask for help. A suggested action is to include mentoring in the charter or terms of reference for a CoP.

The leader and members establish a charter and collectively decide which processes, tools, and procedures work best in a given situation. They are the guardians of competence in that practice within a company and often codify their collective knowledge in a form that can be re-used and adapted by their fellow practitioners. They help each other develop the competence to contribute individually within their business teams and sometimes beyond their company boundaries.

While the power of CoPs is irrefutable, what happens if an organization is not yet prepared to dedicate itself to undertaking the required level of effort to establish one? How do we create and sustain energy for PE's CoP offering in a less structured fashion that can attract attention and interest? The key is to leverage existing technologies and products to form alternative forums for active sharing relationships that form the core of the CoP offering.

Using Yammer and the *Journal of RTLS Lessons Learned Volume II* that PE/LL developed for the RTLS PMO as an example, the traditional method of communicating the journal content would be to email it to a large population and 'hope' they read it and find it beneficial. An alternative Web 2.0 model is to deliver an event that begins with presenting the content at a high level, using researchers or principals, and providing an opportunity for attendees to actively participate in dialogue around different components of the journal as their interest draws them. Known as a 'Yam Jam,' this approach uses Yammer for a live, text-based event where facilitators drive conversation around specific topics. The benefit of the 'Yam Jam' is that it does not follow the typical serial communication (you talk, wait, I talk, wait, you talk) model. It provides an opportunity for multiple parallel conversations, or Yam Jam 'lanes,' where participants gravitate

[12] Based on the work of Kent Greenes (www.greenesconsulting), Nancy Dixon (www.commonknowledge.org), and the KM Teams at British Petroleum from 1995 to 2006..

towards areas that interest them, and input is captured and mined following the event. A trained facilitator, equipped with questions that are designed to solicit a vibrant response, guides conversation within each lane. At the end of the Jam, the product is much larger than anything possible within a serial conversation. Most importantly, the people and relationship networks behind the participants are expressed and captured. In this example, the activity is about using the journal to tap into the passion of the participants. The desired wild success end-state is that folks say, "that was a huge amount of fun. I learned a lot; when can we do this again?" It is a short and intense knowledge sharing session.

This strategy utilizes some of the potentially powerful CoP technologies without specifically calling it a CoP. In essence, this is an exploratory event designed to draw out people with a strong interest in collectively learning from others while increasing their understanding of a new and important technologies. Specifically, we are seeking to 'prove out' some of the CoP technologies and better understand their relative value, while delivering some valuable content. At the end of the event, we can ask the participants a very open-ended question: "is this something you found valuable and in what way?" More importantly, "would you participate in another similar event?" If we do well, we continue in a loose CoP serving all field practitioners who have a passion to learn collectively and share best practices. This event may open the door for a CoP serving those with an interest in learning how to bring this capability to their local VISNs.

Comparing CoPs and Teams

Comparing the differences between CoPs and Teams often helps to build understanding on the basic aspects of communities:

	Community of Practice	Team
Goals	Emerge from the professional interests of the community	Concrete task or project-oriented goals
Membership	Purely voluntary; social pressure may encourage people to join or leave the community	Defined when team is formed; may change based on task or project requirements
Motivation to participate	Based on individual member's desire for personal learning, for social interaction, and need to establish and maintain professional and/or personal identity	Organizational rewards predominate
Structure & Leadership	Fluid; leadership and membership in a core group (if it exists) are based on an individual's actions as a community member	Team leader role either is determined when the team is formed or is dependent on hierarchical status in the organization; some teams are self-organizing; some teams operate without identified leaders
Facilitation	Facilitators often external, but can eventually emerge from the members of the community	Team members take on facilitation roles as necessary
Influence processes	Based on informational factors and thus more deeply internalized. "Informational" refers to the kind of feedback provided by a group when it comments on an individual's behavior and interpersonal relationships.	Based principally on normative factors and therefore less likely to have impact when the individual is not "in" the group
Work processes	Informal; undocumented	Externally determined or are developed according to the norms of the organization
Work products	Generally unstructured; may be tacit	Explicit; structured
Reporting on results	Wholly internal; frequently informal	Required; usually structured
Interaction format	Mainly virtual; face-to-face to launch if at all possible and to renew relationships periodically	Typically face-to-face, but more and more can be virtual
Duration	Indeterminate	Fixed or indeterminate

How to Establish a Community of Practice

There are five basic phases to establishing a successful community: **Engage, Plan and Form, Launch and Sustain**. Figure 11 below provides a high-level guide for development, including the goal, key tasks and deliverables for each phase:

CoP Development Program (CDP)

Phase	Engage	Plan	Form	Launch	Sustain
Goal	Ensure viability of desired CoPs	Agree expectations and tailor approach	Develop core group & focus for each CoP	Formal start-up of CoPs & delivery of quick wins	Ensure continuity and grow value
Key Tasks & Deliverables	•Identify potential CoPs •Identify & engage key stakeholders, potential sponsors & core group members •Clarify business imperatives •Identify enablers and barriers, including technology tools	•Tailor CDP to fit culture, business strategy & processes •Agree CoPs, sponsors & core group members for each CoP •Identify potential CoP members •Work with IT and vendors to define and develop CoP tools •Develop tracking and measurement processes	•Train and coach core group for each CoP •Hold CoP Pre-Launch Workshops •Identify quick wins •Validate focus areas with core groups & sponsors •Engage potential CoP members •Test & implement CoP technology enablers •Finalize CoP measures	•Launch each CoP •Agree Knowledge / best practice transfer priorities •Implement quick wins •Facilitate learning sessions to accelerate performance •Initiate tracking and measurement	•Coach core group to support and grow member participation •Hold monthly CoP exchanges via teleconference •Grow transfer of better practices •Track and communicate progress & value •Facilitate quarterly learning and performance reviews

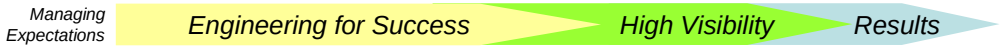


Figure 11: CoP Development Program

Key questions to consider for each phase include:

Engagement Questions:
- Is the proposed CoP viable and valuable?
- What is the scope in terms of organization and context?

Planning Questions:
- What is the business case for the CoP?
- What is the level of support?

Forming Questions:
- Who might lead the group?
- Is the scope clear?
- How will the core team function?

Launching Questions:
- What are this group's critical issues and needs?
- What will best serve their interests?

Sustaining Questions:

- What tasks and activities does the Core team need to support and maintain the CoP?
- Are the members participating and getting value from their involvement?

Roles and Participation in CoPs

Two of the most important, but often misunderstood, elements in a CoP are 'who does what' and managing expectations of participation.

Every community needs to have a leader, members and a facilitator. If the CoP decides to create and manage content to promote sharing and transfer of their explicit knowledge, practices and learning, then they also need someone who can help capture and publish in a digital form on their CoP website. The leader may perform the facilitator role if he or she is trained in CoP facilitation. Otherwise, and is often the case, the facilitation role is provided by another person who is typically not a practitioner in the specific CoP subject area but is experienced as a CoP facilitator with background and competency in Knowledge Management practices. Figure 12 below shows the relationships between the core roles in a typical CoP.

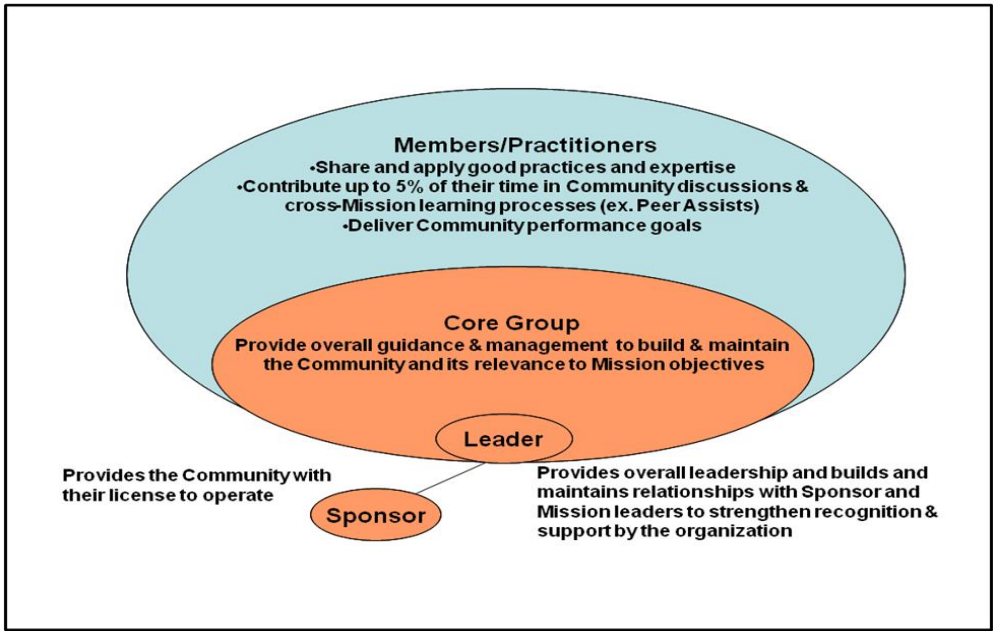


Figure 12: CoP Governance & Roles

Early on in the life of a CoP, many organizations have found it important to manage the expectations of participation of the members. Figure 13 below is intended to provide participants with an understanding of how much they should expect different types of members to participate. The bottom line is you get out of a community what you put in.

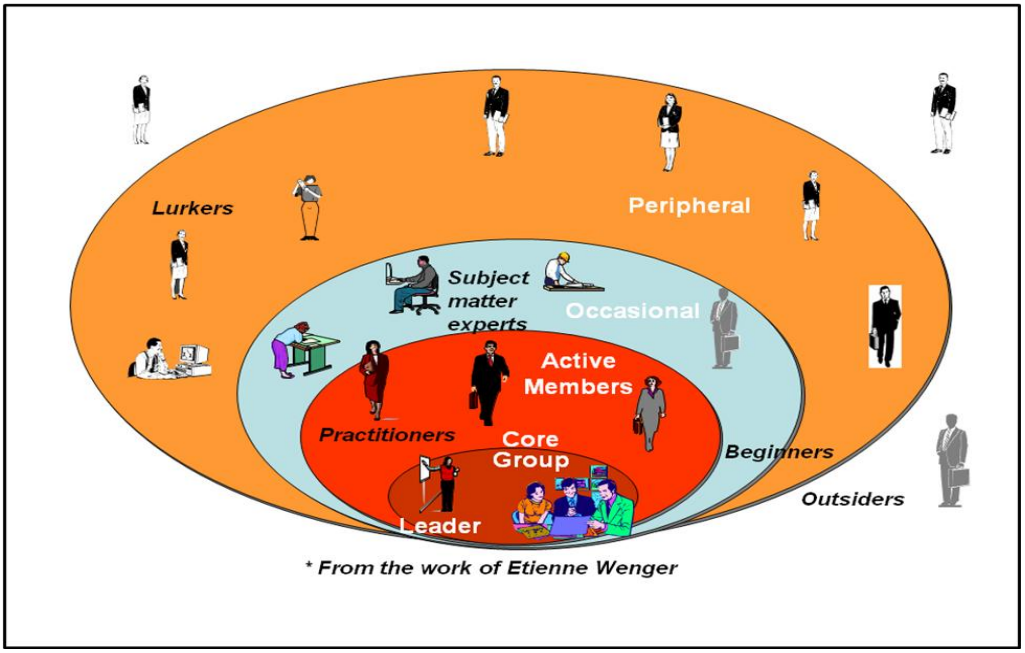


Figure 13: CoP Participation

Basic Operations of CoP

The following are minimum operating requirements of a CoP:

- Meet face-to-face periodically (at least once per year)
- Promote staying connected by holding monthly, one hour teleconferences
- An easy to use website accessible and highly visible that contains:
  - A list of members, their areas of expertise, and how to contact them
  - An on-line discussion forum where members can raise issues, make requests for information or ask for help in problem solving
  - A repository for documents and other artifacts for re-use by the members, *and to prompt and provoke conversation*!

Critical Success Factors for CoPs

All thriving CoPs exhibit the following success factors:

- They are *highly intentional* groups dedicated to sharing knowledge among practitioners
- The members share a common and *specific* sense of purpose
- The knowledge they share and transfer is *highly relevant* to the members current and future business, mission or personal needs
- They operate through trust, *reciprocity and recognition*
- The leader (s) are respected, *passionate and trained*
- The CoP is *facilitated* by someone trained and experienced in CoPs
- There is an easy to use, *virtual* connection place on the web

- The members meet *face-to-face* once in a while

How to Conduct a Yam Jam Event

The following documents key steps in conducting a successful Yam Jam session:

- Concur on Strategy with the Customer. Identify a specific area of interest that is likely to generate enthusiasm and energy among a wide audience. Create a list of key interested parties and potential senior sponsors. It is important to find advocates in different areas of the organization to increase involvement and to spread the planning/pre-event workload.
- Conduct Planning Session. Provide an orientation to the event. Ensure the team is well-positioned to leverage existing learning (make sure participants have a solid understanding of the selected topic); roll captured knowledge into the flow and planning event. Have the team define wild success and define the approach to communications and event planning. Are registrations required? What is the event date horizon?
- Define High-Level Event Flow. Decompose and timeline event into segments. 60 minutes start to finish. 20 minutes live 'talk show,' 40 minutes Yam Jam. Determine number of Yam Jam 'lanes' of discussion. Develop script for the talk show portion.
- Build Agenda and Yam Jam Lane Topics. Create 5-10 questions that participants can choose if they "like" ahead of time and an area where they can suggest their own questions to be "liked" by other participants. This gets people engaged before the Yam Jam and focuses the questions. Pick the most popular questions and categorize them (commonly used categories are: who, what, why, and how).
- Select Speakers and Facilitators.
- Establish Authoritative and Web Accessible Reference Information Point for the Event. As an example, this could be a Clinical wiki page with links to Yammer and VANTS audio information.
- Send Invitations; Get RSVPs; Prepare Yammer Invites. Include reference points from the step, above, in the invitation.
- Set Event and Dry Run Dates. Give plenty of advance notice. Track the list of who's accepted and declined. Remind those that decline that they can view and contribute any time before or after the main event. Place a reminder on a very visible platform such as SharePoint or the Intranet to maximize awareness. Schedule VANTS.
- Complete Dry Run and Capture Learnings. Incorporate presenters, facilitators, domain representatives, and "stunt participants."
- Deliver Event. Leaders should keep an open mind during the session. Remind participants that everyone is free to respond to any of the questions at any time.
- Conduct Action Review. Conduct immediately after the event to capture learning and participant content.

- Publish Summary of Yam Jam Learning.

Lifecycle of a Community of Practice

No one should expect communities to live forever. However, if they form around a sustainable need or profession there's no reason for them not to last as long as there are members who want to learn and support each other. Figure 14 below maps the lifecycle of a successful community. Understanding the effort and activities involved can help one know what to expect and also where attention is required to help the community renew its energy to stay effective for its members.

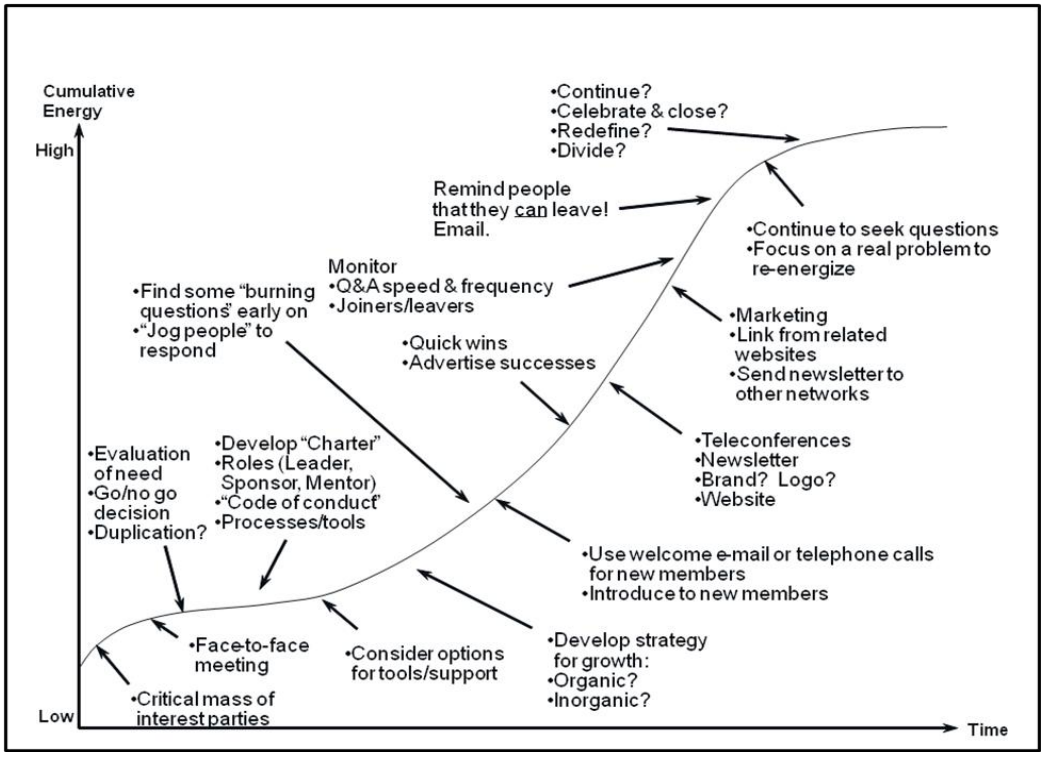


Figure 14: Lifecycle of a Community / Network

Appendix 7 − LL Technology Business Process Requirements

We have identified five "mega processes" that would support the Lessons Learned and Community of Practice capability described in the Operational Scenario. For additional information on these processes, please reference the Evaluation and Analysis of IT Solutions for a Lessons Learned Repository.

1. **Establish a Community Platform**

    a. Security (Assumption is that the platform abides by all security)
    b. Availability (Uptime SLA) (Assumption is that the hosting provider agrees to a specific Uptime SLA)
    c. User & Group Management
    d. People/Group/Content Permissions
    e. Site/Space/Workspace Creation
    f. Document Management Services
        1. Create containers/repositories/lists (e.g. Document Libraries/Wiki Pages)
        2. Check-Out/In
        3. Versioning
        4. File Upload/Downloads
    g. Metadata (Taxonomy & Folksonomy) Support
    h. Index & Search Content
    i. User Defined Profile Pages (e.g. My Site Pages)
    j. Page level asset aggregation (e.g. mashups, feeds based on tags)
    k. Provide KM Facilitator services that support member processes

2. **Capture and Organize Knowledge**

    a. Upload & Download digital files (e.g. document, audio file, video file)
    b. Create and edit a wiki page from a web browser
    c. Create and publish a blog post
    d. Send an email with or without an attachment into a repository
    e. Bookmark external content
    f. Apply metadata to content (e.g. system as well as user defined metadata)
    g. Tagging of formal knowledge: validation and vetting procedures and roles, but some lag time before available
    h. Tagging of informal knowledge: submitted by any practitioner and un-validated, but instantly accessible to inform thinking

3. **Identify, Create, Develop and Leverage Assets**

    a. Schedule, invite members, promote and conduct intentional events to capture & share and apply knowledge
    b. Create/Edit a Document/Page
    c. Create an interactive Forum/Discussion object to capture member dialogue
    d. Respond to (comment on) a blog post
    e. Add a comment to a wiki page

4. **Search and Discover**

    a. Search the Repository (Open Query), Find relevant content (people expertise/content etc.), Determine status of content (raw, finished etc.)
    b. Create RSS feeds from Search queries
    c. Create Alerts from Search queries
    d. Provide for 'Best Bets' capability to point users to frequently requested content queries
    e. Create search scopes that allow users to narrow their searches by metadata or locations

5. **Build and Sustain Community**

    a. Notify members when new asset/content activity occurs in their interest areas
    b. Provide community metrics that provide management oversight as well as encourage desired member behaviors (e.g. contribution points)
    c. Allow members to 'rate' the helpfulness of each other’s content
    d. Provide a messaging system that allows members to send intra-community messages
    e. Provide Web 2.0 like member "I'm following" & "following me" capability to build social networks (e.g. Colleagues)

Appendix 8 − Case Study: Accenture

Case Study: Accenture

Accenture is a $23 billion dollar (net revenues) global management consulting, technology services and outsourcing company, committed to innovation. With over 186,000 employees their ability to compete is driven by their ability to leverage their collective intelligence.

In 2005, Accenture began an internal grass roots initiative to establish a collaborative platform that would:

- Be a place to collaborate, exchange ideas and accelerate (Java) software development through collaborative development.
- Inspired by their own software development process methodologies
- Provide an alternative to Lotus Notes and SharePoint (determined to be too complicated and hard to configure)

Their users requested the following features:

- Enterprise-class wiki, collaborative documentation enabler, versioning and refactoring features.
- Task delegation and issue tracking
- Asset Repository (knowledge exchange 2.0 & software artifacts)
- Robust source control
- Build server with continuous integration and reporting
- Easy installation and configuration
- Cost effective
- Scalability

Accenture's Key Success Factor (KSF) for Adoption Patterns included:

- Top-down: corporate participation due to training and corporate events
- Bottom-up: small interest groups looking for a place to collaborate
- Reward and encourage collaboration
- Low barriers
- No security lockdown

The company selected Atlassian's Confluence wiki as their collaboration platform. Their production setup was surprisingly simple:

- RedHat Enterpise Linux
- 1.6GHz Quad Core Intel CPU
- 4 GB RAM

3 machines

- 1 app server for Confluence 2.2 (Resin), JIRA 2.7.2 (Tomcat)
- 1 DB server (Confluence and JIRA DB (PostgreSQL))
- 1 Apache HTTPD + LDAP tunnel

The platform is externally hosted and managed by Contegix (US).

As a side note, Accenture added an interesting (adoption driving) capability – 'Contributions' – a macro that listens for user contributions and updates the user's profile with the 'credit' that they have earned each time a page is created, modified, or a comment is added.

Notifications, Page Watches and Favorites allowed users to 'tune' their notifications. Once a 'watch' relationship was built between a user and a page, that user received a daily email reflecting page edits as well as associated author information.

The wiki also includes Really Simple Syndication (RSS) capability. RSS helps users subscribe to page content so that it can find its way to their Outlook Inbox. Specially formatted page types provide for 'blogging' capability.

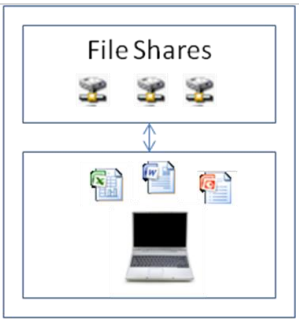
Confluence includes several 'plug-ins' that provide capabilities similar to Excel (Spreadsheet) and Visio (Flow Charting). Although not as powerful as Excel and Visio, these plug-ins help the users continue to work at the 'quick & easy' browser level.

As of 2009, the platform has:

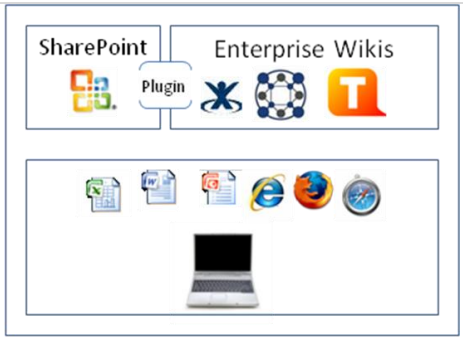
- 94,000+ accessed users
- 1,000+ active page authors
- 12,950 pages (and 127, 965 versions – each page with average of 10 versions)
- 15,000 attachments

The key takeaway from Accenture's experience was the rapid user adoption of a wiki platform. 'Quick & Easy' was the feature most requested by users. This again reflected the broader dynamic of a shift from PC based document collaboration (perceived as slow and hard) to a browser based editing platform in Confluence's wiki (perceived as quick and easy).

The graphic below visually notes the changes in the nature of collaboration over time. The likely short-term end state is a blended approach that brings the platform strengths of SharePoint together with the 'Quick & Easy' nature of Wikis.

File Shares	SharePoint	Wikis
		
PC Based Editing File Share Storage Slow & Hard	PC Based Editing SharePoint Storage SharePoint Improvements •Versioning •Check-In & Out •Alerts •Metadata driven views •Email Links instead of Attachments	Browser Based Editing Plug-Ins provide former PC App functionality Quick & Easy

SharePoint + Wikis



Likely End – State
PC or Browser Based Editing

Plug-Ins Bridge the Browser Gap

Appendix 9 – Air Force Knowledge Know

The Air Force's Knowledge Now (AFKN) program has been in existence since 1999. It addresses the Air Force's need to bring together internal enterprise collaboration with external Department of Defense (DoD) stakeholders. It has grown exponentially: 1,300 members in April, 2002; 16,500 members in April, 2004; and 167,000 members in April, 2007. The AFKN program has been recognized by the Air Force's CIO office, the American Productivity Quality Center (APQC) and the E-Gov Institute as a KM best practice.

The Air Force operates in an environment of unconventional challenge and strategic uncertainty. New challenges associated with this environment demand a more comprehensive, agile and integrated means of operating. This requires successful delivery of knowledge in a context-based, need-driven, virtual environment, available anywhere, anytime. This requirement is compounded by the additional pressures of political, cultural, social, and behavioral forces.

In the near future, IT-based operations that previously focused primarily on total cost of ownership will be forced to focus instead on integration, operational imperatives and organizational maturity. The organizations that best manage a comprehensive, full-spectrum integration will attain high performance and the competitive edge.
In 1999, the Air Force Materiel Command (AFMC), which conducts research and development, acquisition management, test and evaluation, and war fighter logistics support at Wright-Patterson Air Force Base in Ohio and around the world, faced an all-too-familiar dilemma. In 2000, AFMC's Workforce Shaping Office conducted a study, which revealed that, by 2005, approximately 67% of its workforce was eligible for retirement. How could the organization continue to meet ever-increasing mission objectives with an ever-dwindling knowledgebase? It had to find a solution and stave off the imminent talent drain of its civilian workforce until that solution could be implemented.

The AFMC solution called for a strategy that would provide access to knowledge independent of the organization where the knowledge originated. The requirement was to make Air Force knowledge assets available to AFMC's workforce except where rules prohibited access for security or other reasons.

Due to the relatively small KM budget, AFMC's KM effort initially focused on leveraging existing infrastructure and capabilities. As the effort evolved, gaps appeared between available IT infrastructure and the required operational end states. The existing IT infrastructure was originally designed to aggregate and synthesize data and information, not to manage or share knowledge.

As the effort evolved, gaps began to appear around need-driven, context-based usability. Consequently, KM issues faced by other Air Force and DoD organizations outside AFMC also influenced AFMC's KM need. Knowledge knows no bounds; as a result, the interdependencies of Air Force operations demanded a broader solution-set and design capable of overcoming organizational barriers and storage silos Air Force-wide. AFMC set out to deploy a unique opportunity to reshape the way the Air Force addresses the operational challenges of collaboration and sharing.

To close the aforementioned gaps, they addressed end-user usability requirements and provided an IT platform capable of scaling to meet future knowledge-sharing demands. The solution was three-dimensional: employ a new collaborative system based on the virtual community of practice (CoP) concept; include an organizational development methodology to integrate, focus and advance operational performance; and provide a knowledge-solutions support center to identify and address end-user needs. Inevitably, this program evolved from an organizational (AFMC) initiative into an agency-wide (Air Force) initiative. It is now commonly known as AFKN.

The AFKN effort, which combines technology with organizational development services and support, was designated the *Air Force's Center of Excellence for Knowledge Management* by the Air Force CIO in February, 2004. At that time, AFKN had 700 virtual CoPs and 14,000 members from across the Air Force and DoD. Any user within DoD's unclassified portion of the Internet (.mil domain users) is eligible for, and can create, an AFKN account. However, CoP access is multi-level (ranging from open to private) and is executed by community administrators. Personnel from all service branches and DoD agencies—including the Guard and Reserve, civilian service and authorized contractor personnel—participate. The Air Force's ultimate knowledge-sharing vision—to have the ability to share knowledge assets across any boundary—is becoming reality. On April 1, 2007, the AFKN system exceeded 7,300 virtual CoPs and 163,000 members.

Many solution-sets employed in today's operating environments are not designed to support the demands of today's knowledge worker, not to mention supporting the principles of knowledge management. These solution-sets provide capability only to a specific group of users versus the enterprise. Unfortunately, enhancing decision-making, knowledge-sharing and organizational learning is seldom considered in solution design and implementation. As a result, these solutions struggle to enable knowledge workers or affect the demands of today's agile global organizations.

The KM solution-set requires more than technology. Technology provided within KM solution-sets cannot exist alone; it must be compatible with existing infrastructure and address end-user, operational, organizational and enterprise needs. Technology that might be thought of as "a system" is, actually, only a small part of a wider "organizational system" comprising strategy, mission, objective, process, culture, behavior, people and their intellectual capital. The successful solution-set includes interactions between all of these organizational system components, and satisfactory or

high performance depends on the level of synergy achieved through holistic integration. Only through an integrated, comprehensive approach can desired outcomes be realized and lasting value be generated.

The results exceeded expectations. In 2006, the solution for the Air Force was selected as one of five industry best practices by the American Productivity and Quality Center (APQC) for "leveraging knowledge across the value-chain" using knowledge management methods and strategies. In the same year, the E-Gov Institute Advisory Board (consisting of subject-matter experts from government, industry and academia) recognized the AFKN program as an innovative KM best practice. The AFKN solution earned the E-Gov Institute's 2006 award for a "Knowledge Management Initiative Delivering High Value to a Broad User Community/Supporting Agency Mission." KM benefits and success can be defined in many ways: cost and budget savings, cost avoidance and productivity gains; action synchronization; shared understanding and awareness; even the development of workforce skill. The secret to KM success, however defined, stems from a comprehensive methodology that draws principles and techniques from multiple systems theories and management sciences.

VHA organizational challenges are similar to the Air Force in that we also require resources that work jointly and in concert across the value-chain. High levels of performance can only result from increasing levels of collaboration and knowledge sharing across temporal, geographical, cultural and functional boundaries. Knowledge workers require clean data, accessible information, relevant knowledge and keen foresight to respond to agile organizational needs.

If comprehensive applicability and usability are overlooked or not properly understood, the solution-set will fail, resulting in an ignored or actively rejected investment. The AFKN solution was designed to serve as a catalyst for Air Force change, to enable an integrated workforce that is more agile and capable against a wide range of challenges.

Appendix 10 - Guide to "Quick Win" Lessons Learned

In response to a request from VHA's Chief Business Office (CBO), the LL Domain has created a document that describes what a Lesson Learned is, and how to capture lessons that present themselves informally via conversations with others, or upon reflection of one's individual work. These lessons are called "Quick Win" lessons learned, and are explained in the following paragraphs. Because this is a new concept that has yet to be proven through experience, we are not incorporating this directly into this document, but rather leaving it as an Appendix. We have also developed a prototype SharePoint site to capture these lessons. The processes and procedures for using such a site will be documented in this document once the site has been tested and approved by the CBO customer.

A. What is a Lesson Learned (LL)?

A lesson learned is knowledge gained through experience which, if shared, would benefit the work of others.

Lessons learned can be categorized as:

- something learned from experience,
- an adverse experience that is captured and shared to avoid a recurrence,
- an innovative approach that is captured and shared to promote repeat application, or
- the knowledge acquired from an innovation or an adverse experience that leads to a process improvement.

"Quick Wins" are lessons learned that are observed in the day-to-day course of work and documented quickly and concisely for the benefit of others.

B. Why Lessons Learned are Important

Ultimately, lessons learned are a matter of improving the productivity and efficiency of a process. Individuals or teams can benefit from the knowledge gained through the experience of those who have gone before them. Many organizations that label themselves as "learning organizations" often overlook their own experiences as a platform for learning. They assume that their collective experiences are passed along to the next person or group. To be considered a learning organization we must be proactive, capture lessons learned, and "cross-pollinate" the concepts through training or other techniques that expose the information to others who may benefit from it. The application of lessons learned helps produce project teams which operate with less risk of failure, increased efficiency, and more awareness of their surroundings.

C. When to Document Lessons Learned

In recording lessons learned, and other knowledge and best practices, there are some guidelines that have proven to be quite effective. First, is this knowledge based on real

experience? The powerful force of practical experience, explaining what was done and why, increases the probability of reuse which is the goal, not pure capture. Second, is the lesson meaningful to someone besides the source? The simple question, "So what?" is a simple but powerful question to answer before content is added to a repository. If the answer is compelling then the lesson is added to the repository. Such a simple process keeps the repository vibrant and relevant and avoids the problem of the lessons learned repository becoming an information storage area. Third, if someone reads or listens to this lesson can it make a difference? Are there insights or advice on critical organizational needs contained in what has been captured or offered up as content? Again the focus is on relevance and reusability to the widest possible audience. Finally, there is a validation step with practitioners. Does the lesson stand out to someone who makes it his or her business to deal with the issue at hand?

D. What does a Good Lesson Learned Look Like?

Documenting a useful lesson learned requires a clear understanding of the purpose and importance of documenting the successes and failures of a project. Because lessons learned serve as an important management tool in retaining organizational knowledge, reducing project risk, and improving project performance, they must have relevance to future projects. To build relevance into your lessons learned and make them of value to others in addressing similar situations, you must:

- identify the context in which the problem or best practice arose
- describe how the problem or best practice arose and define the problem or positive development encountered and its impact, and
- provide concrete, practical solutions or recommendations based on this experience.

Statements such as "Clearly defined roles and responsibilities, along with a strong focus on communication channels, are essential to project success." are not effective lessons learned. There is no context for the statement, and without context such a statement serves only as a basic Project Management best practice. While requiring a little more effort to develop, the following approach describes a lesson in a context that defines what activity or process affected by the lesson learned, what the problem was that led to the lesson being learned, and how the lesson learned can serve future projects before a problem arises.

E. Capturing "Quick Win" Lessons Learned

The following guidelines provide a fast and easy way to capture a Quick Win. They can also be used for documenting other useful pieces of knowledge or best practices that others may need to know. Figure 1 shows an example of a Quick Win.

1. Identify the Quick Win

Create a title that reflects how you would refer to this lesson learned when talking to a colleague or friend. Record the name of the organization, project and/or event associated with the lesson learned.

2. Describe the Lesson

Describe the lesson learned, knowledge or best practice in 3 sections. Each section should be no longer than a couple of sentences. The idea is to be concise and document the knowledge in a manner that entices someone to contact you for more information. Most people will read a short lesson learned. *(Hint: take 5 minutes and reflect on the lesson you want to share before you write anything…if you were in an elevator with someone that you really wanted to share this with, what would you say in the few minutes you have?)*

Context

Describe what was going on in the environment (internal and external drivers relating to business, organization/culture and local conditions) where and when the lesson was created. Think of what someone else would need to know to be able to make sense of

what you did and adapt and apply it in their situation. Describe the lesson in the form of an experience. Explain the actual implementation – the steps you took, and/or core processes/activities you worked through. Be specific and as concise as possible.

Result Description and Impact

Describe the impact or business result enabled by the application of this knowledge and ***why*** it made a difference. Quantify or qualify the pain or gain, which might motivate someone to actually act differently as a result of your experience. Where possible, share the experience through the words used by those who felt the impact of the knowledge - a quote or paraphrasing someone can go a long way toward getting someone to really consider using the knowledge.

Lesson and Advice

Describe what you learned from the application of the lesson. What's the one thing that stands out for you that you want to remember the next time you apply this knowledge? Who would benefit from this lesson? What would you advise someone else who may want to apply this knowledge in the future?

Provide Contact Information

Include your name, date of the documentation and how best to contact you.

Title	Wildland Urban Interface Fire Plan Improves Interagency Coordination
Context	The Black Star Fire occurred within a planning area of a wildland urban interface fire plan. This fire required rapid augmentation of interagency resources by both Orange County Fire and the Forest Service and the evacuation of a canyon with about 75 residences. The preplan called for rapid escalation, immediate unification of command, unified resource ordering, extended coordination with law enforcement and the immediate involvement of the Red Cross in staffing evacuation centers. This fire was the first test of the new plan.
Result Description and Impact	Responders felt the plan added significantly to the response and helped avert development of a major fire. (The fire was held to 35 acres). Interagency issues had blocked out better cooperation in the past. A series of meetings and a sincere attempt to work cooperatively yielded plans that made the most of each agency's resources. Civilian involvement was also critical to plan acceptance. Workshops held within the community boosted plan acceptance. Extensive efforts were made to share the plan with the community, including presentation of evacuation routes and issues. On fire day, residents reacted immediately in cooperation with responding agencies.
Lesson & Advice	Cooperative and combined training between County and Forest Service units really paid off in this response. Communications had been enhanced and practiced, and crews integrated for fire attack. This led to unusually strong and cooperative fire attack. Expanded training and exercises should see this improve even more. Preplanning between fire and law led to unparalleled assistance at this fire from law and better coordination, a real and tangible benefit from the planning effort. This should be expanded through more tabletop exercises. Some of the evacuation relocation sites and coordination with support groups such as Red Cross needs to be enhanced so that it follows plan recommendations.
Contact	Center Manager, National Advanced Fire and Resource Institute (520-799-8760)

Figure 1. Sample Quick Win Lesson Learned. This sample of a quick win is easy to read and conveys the lesson and context clearly.

The key purpose for capturing a quick win is to benefit the work of others.

Appendix 11 – Engagement Strategy

As the LL program matures and the team engages with multiple customers on multiple levels, the process for these engagements continues to evolve. This addendum addresses these emerging thought processes and highlights an approach that has become more defined based upon the team's process improvement efforts. It represents the next "tier," or level of detail within the overarching framework described in the body of this CONOPs and reflects continued refinement of integration practices and cross-cutting activities across all PE domains. Each stage results in a deliverable that guides the next action.

A. Create Engagement

This initiates the process of engaging a new project and begins by identifying the customer. It could be an existing customer with new requirements or a new one who is interested in exploring PE's services. During this stage, the team explores customer objectives with the customer project lead and determines the level of engagement that will produce the desired outcomes. This could be lessons-learned specific or involve multiple PE domains. Through initial background research, the team brings a level of knowledge and understanding of the customer and their potential issues to help inform discussions and facilitate identification of goals and objectives.

Deliverable

An Integrated Charter that addresses the following:

- Project Background
- PE Program Overview
- Integrated Engagement Description
- Key Milestones
- Steering Committee
- User Working Groups
- Risks and Mitigation Strategies
- Communications Plan
- Team Member Commitment and Roles and Responsibilities
- Commitment to Continuous Improvement
- Integrated Charter Approval

B. Catalog Lessons Learned Categories

Once the charter is codified, the LL team begins by exploring broad categories associated with customers' portfolios where potential LL solutions could be harvested. These include, but are not limited to:

- Acquisition
- Requirements Development

- Site Preparation
- PMO Functions
- Testing
- Project Reporting
- Qualified Personnel
- Products
- Customer
- Process Improvement
- Policies
- Organizational Dynamics
- Communications

Identifying avenues for collecting information helps to ask the right questions and focus the engagement on what will be the most beneficial for customer learning. It will serve as a data point for scoping the project and understanding potential breadth and depth of PE integration, determining research requirements, highlighting potential outcomes more clearly (e.g., specific lessons, best practices, ideas to explore, risks of not adopting an identified lesson, gaps in knowledge, value of implementing lessons), and discovering notional audiences who will likely be involved.

Deliverable

A set of General Categories that will guide the LL team's project planning. It includes, but is not limited to:

- Associated Domain-related Questions
- Research Targets
- LL Data Mining Possibilities
- Prospective Audiences

The team will vet this through the customer project lead for buy-in and for insights on potential areas of sensitivity that could influence engagement implementation strategies.

C. Develop Strategy

Using all acquired information and knowledge, the LL team will create an overarching strategy framework that will provide the foundation for a more detailed project plan. The deliverable for this phase is a comprehensive, high-level strategy map that incorporates an integrated approach for engagement execution. The team will brainstorm each strategy using the following criteria outlined in Section XII of this document:

- Business Impact: potential improvement and value to be gained by sharing, transferring, and applying lessons learned. This also addresses audiences, timing, and duration, which drives the complexity of the project.

- Business Advocacy: level of commitment by the sponsor of the Lessons Learned project and identification of key stakeholders. This will be a key indicator of project success.
- Transferability and Reach: range and breadth of impact of the LL project across the organization. This will illuminate to what extent the engagement is more limited in scope or has broader, enterprise-level applicability.
- Feasibility: organizational and technical enablers and barriers that will likely impact the successful sharing and transfer of lessons learned in the project.

This phase also produces the first-level milestones and areas of focus, to include the following:

- Phases
  - As applicable, and documented in the charter
- Subject Focus Areas, per Phase
  - Based upon cataloging and additional exchanges with the customer project lead and/or other stakeholders
- Internal & External Research Venues
  - Includes interviews and cross-referencing other domain activities and projects
- LL Capture Events
  - Includes notional type and timing, associated with the customer's project schedule
- Knowledge Base Outcome and Associated Products
  - Driven by complexity of the engagement and customer requirements
- Disseminators and Receivers
  - Incorporates leadership, stakeholders, and staff

Deliverable

A Strategic Framework captured in MS Word and/or MS PowerPoint encapsulating all of the above.

D. Create Engagement Project Plan

This is where the team documents outcome-oriented activities that link to the overarching strategy. The Engagement Project Plan is organized into the following three, inter-related functions that correlate to the LL methodology outlined in Sections IX and X:

- Organizational Learning
  - Focused on conducting Peer Assist activities, developing the tailored approach and action plans, and documenting key learnings associated with this stage
- Organizational Review

    - Focused on conducting Action Review activities, developing LL capture venues, and documenting key learnings associated with this stage
- Organizational Retrospect
    - Focused on conducting Retrospect activities, documenting key learnings, and crafting and disseminating recommendations and enterprise-level action plans

It documents a complete account of an engagement's lifecycle from creation, through execution, to closeout. It reflects the rigor of the team's thought processes by associating an activity with an outcome, documenting specific tasks and tools designed to optimize data mining and lessons learned capture (e.g., interviewing, document research, conducting site visits, facilitating LL capture sessions), recording what the team produces and disseminates during the engagement lifecycle, and highlighting dependencies.

Deliverable

A comprehensive Project Plan documented in MS Project.

E. Execute Engagement Project Plan

LL team members become embedded in engagement planning activities documented in the Project Plan. During each function, there is a continuous process of capturing, analyzing, compiling and recommending, and disseminating LL-related information. By design, these overlap in order to ensure continuous learning and sharing of that information.

Capture

As noted above, the LL team employs numerous methods and tools to stay informed and connected to projects and customers as well as to assist customers harvest their LL information and knowledge. The capture process is dynamic, and team members select the best approach to achieve the optimal outcome under any given circumstance. This includes training customers on LL capture techniques (Action Reviews), conducting capture sessions using collaborative software, conducting field research, as required, creating Communities of Practice (CoPs), and creating customer-specific LL portals.

Analyze

Inherent in these engagement activities is the intellectual capital associated with "deep dive" analysis. Using multiple venues, the LL team examines all analytical intersections to capture a 360° picture of the customer and the product around which the engagement centers. We explore and document the extent to which other PE domain activities directly or tangentially affect the project. We also examine how other VHA entities and their programs may intersect a specific engagement in order to understand the mutual effects on the enterprise. For example, as the Pharmacy Re-engineering project enters national release of its Medication Order Check Healthcare Application (MOCHA) product, there are risks that existing, national-level programs not associated with the re-engineering technologies may impact the operability of the new application. The LL

team assists customers capture and share those lessons as well as those relating to product adoption. The LL team also analyzes lessons learned from other customer experiences to validate a discovery, such as recognizing the need to tailor training to specific end users, and to identify trends that could be adapted as an enterprise LL.

Compile and Recommend
Once the LL team collects and analyzes the information, we identify the recipients of the knowledge and determine what they need and how they intend to apply it, any risks, issues, or concerns associated with the knowledge, and who else will use it or be informed. This will shape the manner in which we compile the information (e.g., LL specifically associated with the engagement vs. a larger compilation that incorporates LL from multiple engagements), and influence the nature of the LL team's recommendations. Understanding the scope creates the foundation for basing recommendations on a variety of outcomes, e.g., localized LL affecting smaller audiences and/or applications vs. enterprise-level LL affecting multiple audiences and programs.

Disseminate
Finally, lessons learned can be disseminated via multiple media avenues depending upon the intended recipient. For maximum capture and dissemination for broader audiences, web portals, wikis, blogs, and Yammer, are useful options. For those who share a common practice, domain, or profession, a Community of Practice (CoP) is a very effective method for sharing and transferring knowledge. Reports and briefings are appropriate for leadership and for customer project closure. The intent is to collect, analyze, compile, and share those lessons that provide the greatest value for the customer in a manner that optimally supports their intended application.

Deliverables

Options driven by audience, scope, and purpose.

Appendix 12 - LL Engagement Charter Best Practices Template

The purpose of this Appendix is to describe a Best Practices template for developing a Lessons Learned Engagement Charter. A charter defines the engagement relationship between Product Effectiveness Lessons Learned and its customers. The practices depicted in this appendix are meant to improve the efficiency of producing a charter as well as inform the reader of the value of a establishing a formal charter.

The table below decomposes the sections of a representative charter template. The notes column provides background and guidance relative to the section to the left.

Section Sample	Notes
Integrated Project Charter **VHA Office of Health Information, Product Effectiveness** **Healthcare Technology Management (HTM)** **Community of Practice (CoP) Initiative**	The title should capture the customer and engagement name.
CHARTER OVERVIEW This document will authorize the Veterans Health Administration (VHA) Office of Health Information (OHI) Product Effectiveness (PE) group to initiate work in support of the Healthcare Technology Management (HTM) Biomedical Community of Practice (CoP) initiative. The following items are addressed in this charter: • HTM CoP Initiative Background • PE Program Overview • Integrated Engagement Description • Key Milestones • Steering Committee • User Working Groups • Risks and Mitigation Strategies • Communication Plan • Team Member Commitment • Commitment to Continuous Improvement • Integrated Charter Approval	The overview serves as the sectional table of contents.
HTM COMMUNITY OF PRACTICE INITIATIVE BACKGROUND The mission of Healthcare Technology Management (HTM) ("Biomedical Engineering") in VHA is to provide a comprehensive, cost-managed medical equipment environment that is safe, technically sound, and professionally maintained. Biomedical Engineers advance patient care by applying engineering and managerial skills to healthcare technology. They	The customer's background helps the team understand the customer and answers the question 'how did we get here'?

Section Sample	Notes
are expert problem solvers at the national, VISN and facility level working with complex human and technological systems. The VHA Biomedical Engineering Program includes a 1000 person workforce across 160 hospitals and managing $5.3 Billion worth of technology and equipment. In July 2011, Mr. Kurt Finke assumed responsibilities as the HTM Director charged with leading this 1000-person workforce. Upon arrival, he articulated a challenge to the organization: how could the Biomedical Engineering Community better leverage isolated expertise for the good of many across a network of 160 hospitals in light of the following conditions: Expertise is sprinkled unevenly across the country. Budget and personnel are constrained. The workforce is asked to do more with our existing resources. New clinical technologies are constantly evolving and arriving. The volume of technical information is growing constantly. Old systems to keep current on as their lifespans are extended. In response to this challenge, Product Effectiveness initiated contact Mr. Finke and briefed him on PE's Lessons Learned capability and more specifically the Community of Practice (CoP) service offering. A CoP is a voluntary group of peers, practitioners, and other individuals whose members regularly engage in sharing and learning, based on common interests, to improve their individual performance, the performance of their teams, and the performance of their overall organization. CoPs are typically drawn together by common work products and processes. The leader and members establish a charter and collectively decide which processes, tools, and procedures work best in a given situation. They are the guardians of competence in that practice within an organization and often codify their collective know-how in a form that can be re-used and adapted by their fellow practitioners. They help each other develop the competence to contribute individually within their business teams and sometimes beyond their organizational boundaries.	
PE PROGRAM OVERVIEW To maximize the benefits achieved from investments, VHA OHI has established the PE group with a goal aimed at improving the effectiveness of VHA sponsored IT and non-IT programs and	The PE Program Overview section provides an overview of the Product Effectiveness (PE)

Section Sample	Notes
products through ongoing assessments and analyses. PE resides within OHI under the offices of Business Operations and Service Coordination. The mission of the PE group is to perform independent assessments and analyses on specially selected programs or products to ensure they are effective and meet the needs of the customer. PE is organized into four (4) separate but related domains: Benefits Realization, Customer Satisfaction, Functional/Gate Reviews and Lessons Learned. These are described in more detail in the following table.	organization. This section helps educate the customer on the roles and functions of each of the PE domains. Although all domains may not be engaged in every engagement, this section helps educate the customer on related PE functions.

PE Domain Name	Description of Services
Benefits Realization	PE will review and enhance Business Cases (BC) and Cost Benefit Analyses (CBA), in support of measuring baseline and post-deployment benefits of the investment. PE will also define the benefits and metrics, and conduct baseline measurements on the program or product. Once a program, project or product is deployed or completed, PE will measure the benefits specified in the business case or the benefits measurement plan to ensure VHA has realized the objectives and benefits the investment was expected to achieve.
Functional/Gate Reviews	Once an investment is approved, PE will track the program/project/ product through its full lifecycle to ensure operational readiness upon deployment/completion. This domain may also be involved in one or all of the following stages depending on engagement requirements: • Initiation • Planning & Definition • Design & Execution • Deployment / Completion • Monitoring & Controlling

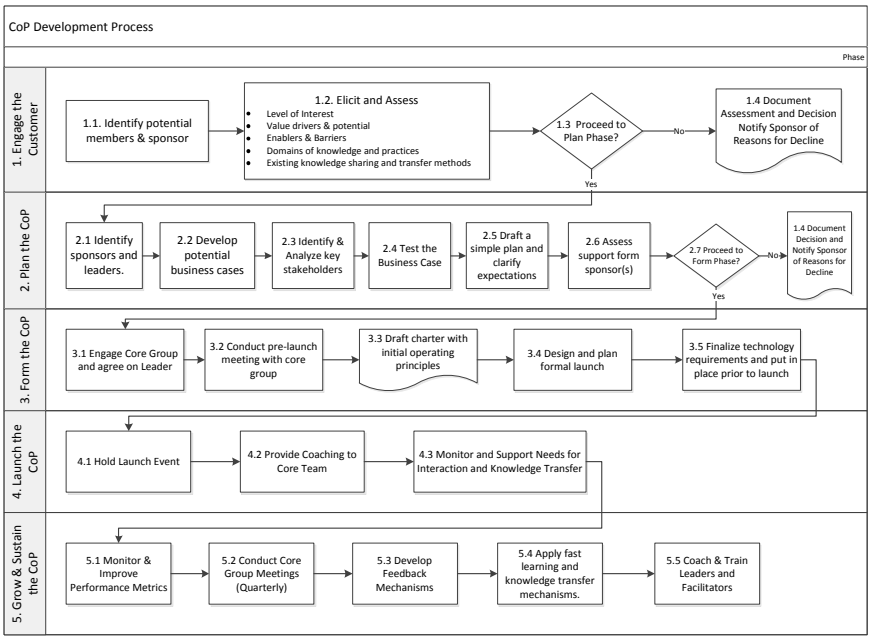
Section Sample		Notes
Customer Satisfaction	PE will leverage proven survey methodologies to perform qualitative analysis and assessments of customer satisfaction levels and solicit direct stakeholder/end user feedback on the effectiveness of the program/product. PE leverages surveying methods to solicit general input from the VHA community on specific programs/products to collect qualitative data and provide unbiased reports of findings and recommendations for improving their effectiveness.	
Lessons Learned	Throughout the course of a program or a product's lifecycle, PE will compile lessons learned and research lessons and industry best practices from similar projects and external sources to establish a valuable knowledgebase designed to provide efficient and just-in-time insight on program and product-centric improvements. The Lessons Learned domain also provides Community of Practice design, planning and support services for customers facing knowledge network and sharing challenges.	
INTEGRATED ENGAGEMENT DESCRIPTION PE can support HTM in its Community of Practice (CoP) efforts by providing Lessons Learned services as requested by the HTM Director. The PE Team will establish a primary contact to serve as the integration point between PE and HTM. This integrated point of contact (POC) will work to limit the burden on HTM leadership and gain efficiencies in communication. The HTM Director should work with the integrated POC to coordinate engaging individual PE domain services. Once the HTM Director requests an individual PE domain's services, an addendum will be added to this Integrated Project Charter (found at the end of this Integrated Charter) that specifically describes the services of the particular engagement.		The engagement description provides high-level information on how PE can provide service to the customer. A detailed work summary is captured within the addendum.
KEY MILESTONES As the HTM Director establishes new engagements with a PE domain, the team will develop key milestones for each particular domain engagement. These key milestones will be captured in the respective engagement addendum added to this Integrated Project Charter as well as in each specific engagement's project schedule.		The Key Milestones are a central tenet of the PE engagement delivery model. Specific key milestones are included in the

Section Sample	Notes
Each addendum project charter will go through a review and approval process by the charter members.	Addendum.
STEERING COMMITTEE A Steering Committee will be established to discuss project status, resolve key issues, and strategically guide the HTM CoP Engagement toward successful completion. The Steering Committee will meet on a monthly and ad hoc basis, depending on the need. Members of the Steering Committee will also be called upon to provide input on various aspects of the project, including the composition of User Working Groups, Communication Plans, etc. Over time, additional members may be added to the Steering Committee to reflect the type and level of involvement necessary as the various PE domains are engaged. In order for the timelines to be met, it is imperative that each Steering Committee member reply to emails and PE team requests within an agreed-upon business timeframe. Additionally, members should designate replacement members when out of the office so decisions are not delayed and project remains on schedule. The following individuals will initially be members of the Steering Committee for the HTM CoP PE Engagement : Kurt Finke – Director – Healthcare Technology Management Jennifer Ford – Director – Product Effectiveness Michelle Baquie – Biomedical Engineer Ron Luycx – PE Lessons Learned Domain Lead	The use and description of a Steering Committee describes the engagement governance. The steering committee provides a mechanism for executive guidance and oversight of the engagement.
USER WORKING GROUPS User Working Groups may be formed as individual PE domains become engaged. These User Working Groups will be comprised of key individuals from HTM and the applicable PE domains. The actual composition and structure of each User Working Group will be decided based on the execution of addendums to the Integrated Project Charter. While the Steering Committee will assist the PE Team with strategic decisions, the User Working Groups will provide PE domains with tactical information required to successfully execute each domain's efforts.	Describing the potential formation of user working groups conveys the importance of users input into requirements and product/system adoption.
PROJECT RISKS AND MITIGATION STRATEGIES The following risk has been identified as a potential threat to the project, including a corresponding mitigation strategy to reduce its likelihood and/or impact. RISK: Members of the Steering Committee (HTM and OIT) are	Detailing the engagement risks and mitigations convey an understanding of 'what could go wrong' with a

Section Sample	Notes
not able to consistently, actively, and substantively participate in the planning, design, and execution of the HTM CoP PE Engagement. MITIGATION STRATEGY 1: Set the team members' expectations by using this Project Charter to outline the responsibilities of the Steering Committee. Each Steering Committee member shall respond to requests for information (emails, phone calls, etc.) within agreed-upon business timeframes. Each Steering Committee member shall designate a replacement member to attend meetings and respond to information requests in case the original member is absent. The PE Team will obtain and document the required approvals to authorize each team member's involvement in the project. Finally, the PE team will actively communicate the project goals in an effort to facilitate buy-in and support for the HTM CoP PE Engagement objectives. MITIGATION STRATEGY 2: Expand the existing HTM Steering Committee rather than develop a PE specific Steering Committee. This will best leverage HTM status reviews, decision facilitation and communication processes, thus streamlining Steering Committee team participation and commitment levels. Please note: Additional risks and mitigation strategies will be identified and captured on the individual engagement addendums, which are found at the end of this Integrated Charter.	mitigation effort(s). A clear understanding of risks helps reduce uncertainty and unexpected 'surprises'.
COMMUNICATION PLAN The PE Team will utilize the monthly and ad-hoc Steering Committee meetings as its primary venue for communicating project status, key findings, issues, and risks to the Steering Committee. Additionally, the OHI communications team will be notified of project charter initiation, presentation of findings, and project outcome. Reviews of all key deliverables will begin with a PE internal review prior to sharing with the project Steering Committee. Between each respective review, the PE Team is responsible for capturing and including all changes recommended by project stakeholders. Communication of project status and key deliverables will follow the order detailed below: Notify OHI communications team of project initiation PE internal review Project Steering Committee Notify OHI Communications team of project outcome	The communication plan section sets expectations on how and when the engagement team and customer will communicate.

Section Sample	Notes
The Steering Committee will have the opportunity to provide addendums to address report findings and recommendations. After reviewing with the Steering Committee and VHA OHI leadership, the final project Report may be shared with other interested stakeholders within VHA. Portions or synopsis of project findings may also be used by the PE Program team for reference purposes.	
TEAM MEMBER COMMITMENT The PE Team has the primary responsibility for facilitating a successful conclusion to the HTM CoP PE Engagement and its related deliverables; however, the Steering Committee and User Working Groups must also support the project by providing substantive and timely feedback regarding project deliverables as well as key findings, issues, and risks. The Steering Committee will provide oversight and review of all key project deliverables in a timely fashion. The scope of this Integrated Project Charter ends once the Steering Committee members have concluded that the HTM CoP Engagement has been successfully completed, including the specific domain engagements listed as addendums to this Integrated Charter.	The Team Member Commitment section describes how success is tied to commitment. Commitment is a responsibility of both the PE delivery team and the customer.
COMMITMENT TO CONTINUOUS IMPROVEMENT In an effort to continuously improve its operations and client service, the PE Team will conduct post-engagement reviews following the execution of each PE engagement with the HTM team. These reviews will capture the successes and challenges from the engagement and may be facilitated in the form of a survey, focus group, retrospective, or similar format. By signing this Integrated Project Charter, the HTM Steering Committee and User Working Group members agree to provide feedback to the PE Team on its performance during the engagement to assist PE to continuously improve its operations and client service.	The Continuous Improvement section communicates a culture of continuous learning. This section helps set a tone for the engagement where all feedback (good and bad) is solicited and appreciated.
INTEGRATED CHARTER APPROVAL Approval of the charter indicates an understanding of the purpose for the HTM Integrated PE Engagement. By signing this document, each individual agrees work should be initiated and resources will be committed as described herein. Approval may be provided via email sent to Jennifer Ford (jennifer.ford@va.gov) and Wasfi Alnabki (wasfi.alnabki@va.gov). In the email subject line, please utilize the following subject: "HTM CoP PE Engagement Project Approval." Please state that the integrated charter has been "approved" in the body of the email.	The approval section is the physical manifestation of the commitments formed by the charter document.

Section Sample	Notes
Subsequent addendums to this Integrated Project Charter will also require email approval. To approve addendums, please utilize the email approval process described in the paragraph above.	
Addendum #1: **PE Lessons Learned Services** **For Office of Healthcare Technology Management (HTM)**	The Addendums should be numbered and describe the specific work.
ADDENDUM PURPOSE This Addendum #1 authorizes the Product Effectiveness group (PE) to initiate Lessons Learned services for the planning, design and implementation of Communities of practice for the Biomedical Engineering Community. HTM has selected 7 initial Communities of Practice to plan, provision and launch a formal governance structure and enabling technology. Each area represents a specific technical competency area reaching across each of the 160 hospitals. These initial communities include: 1. CT Technology 2. Ultrasound Systems 3. Anesthesia Delivery Systems 4. Infusion Systems 5. Retinal Cameras and Teleretinal Imaging Systems 6. ICU Clinical Information Systems 7. RTLS (Real Time Location Systems) In addition to these 7 communities, a CoP supporting staff assigned to the role of Community Leader will be designed and formed. This CoP Leader CoP will be the first community formed and help to serve as a model for the actual practitioner communities.	The addendum purpose describes the background and authorizes the work to be performed.
LL SERVICES DESCRIPTION The PE Lessons Learned (LL) domain adds value to the HTM CoP Initiative by ensuring a repeatable implementation model is in place that measures business benefit within each specific HTM community. LL serves as a mechanism to reduce implementation risk by the sharing and integration of best practices. Specifically, LL adds value by providing: • PE provides CoP expertise and guidance in deploying CoPs. • Mentoring, coaching, and administrative support. • Assistance with enabling technology selection and implementation. • CoP Leader / Facilitator Training. • Sustaining membership in Community of Practice for CoP Leaders. • Identification and analysis of data/trends may reflect systemic	The Services Description provides information on the specific services to be performed. The section should describe the business value of the services being provided.

Section Sample	Notes
issues as well as enterprise lessons learned.	
PROJECT DESCRIPTION The LL Team will work closely with HTM leadership to plan and launch CoPs. The project will follow the published '**CoP Process and Procedures**' document reflected in Figure 1 – CoP Development Process flow.  **Figure 1 - CoP Development Process Flow** A project kickoff meeting will serve as the initial planning venue that will be used to identify initial communities. Regular coordination meetings between the LL Team and HTM Program Management team will be organized to support LL planning, discuss project status, resolve issues and generally guide the process towards a successful completion.	The project description provides additional information related to the engagement activities.
KEY MILESTONES Upon execution of this Addendum, the PE/LL Team will have the primary responsibility for performing the key milestones listed below. Based on the tailored approach to align with the HTM CoP initiative schedule(s), implementation strategies, and some of the milestones may be repeated as required. Initial Discovery Meeting Biomed CoP Primer Document Approved Founders Call (1 of 3) presentation approved. CoP Founders Call San Antonio Conference presentation approved Biomed CoP Web Page Established	The Key Milestones section outlines the specific major activities planned within the engagement.

Section Sample	Notes
San Antonio Conference Presentation on CoPs delivered CoP Founders Call (2 of 3) CoP Founders Call (3 of 3) CoP Leader Facilitation Training Event Scheduled CoP Leader Training Draft HMT Biomed CoP Charter Draft HMT Biomed CoP Charter Finalized CoP Collaborative Technology Model Approved Collaborative Technology Built Out CoP Wave 1 Launch Event CoP Wave 2 Launch Event CoP Wave 3 Launch Event Sustaining Support Model In Place (Note: A sustaining effort to support CoPs is outside the scope of this charter. When appropriate, an additional addendum to this charter can be established to deliver these services.)	
HTM CoP LEADER WORKING GROUP The founding HTM CoP Leaders as selected by the executive sponsor will serve as a cross community team helping define a standard model for follow on communities as well as help to aggregate and document the business benefits within each community.	This section should describe the usage of any customer user groups.
LESSONS LEARNED SERVICES RISKS AND MITIGATION STRATEGIES Following are key risks that have been identified, along with the corresponding strategies that have been developed to mitigate each risk: RISK: Members of the CoP Leader Working group are not able to consistently, actively, and substantively participate in this project. MITIGATION STRATEGY: The LL Team will actively communicate the goals for the project in an effort to facilitate buy-in and support for the effort. Additionally, team members' commitment to the project will be communicated by using this Integrated Project Charter to outline the responsibilities of the CoP Leader Working Group. In order to adhere to the stated milestones, it is imperative that CoP Leader Working Group members respond to requests for information (emails, phone calls, etc.) regarding the exit criteria within an acceptable timeframe (2-3 business days) and designate replacement members when out of the office. RISK: The 'flat' characteristics of a community of practice create tension within the hierarchical reporting organization. Sometimes	This section describes the specific risks and mitigations related to the planned tactical work.

Section Sample	Notes
CoPs create tension resulting from moving information faster than the traditional hierarchy. Depending on personalities within the traditional network, this may create a condition where information is flowing in new patterns that leave some people out of touch. MITIGATION STRATEGY: The HTM sponsor will proactively communicate with the VISN leadership where CoPs are present to educate and ensure understanding of the business benefits of CoPs. Key in mitigation is understanding and overcoming the problem before it has a chance to fester and worsen.	
PROJECT APPROVAL This addendum will be considered approved upon signing the Charter Approval section of the Integrated Project Charter above (or through email approval, as described in that same section). Future addendums to this Integrated Project Charter will require email approval, as described in the Charter Approval section above. This addendum will only be considered unapproved through express written communication provided by HTM Program personnel listed in the Charter Approval section of the above Integrated Project Charter.	The project approval section describes how the Addendum approval will be obtained. In general the Charter requires a signature while the addendum approvals can be made via email.

This Appendix has provided a best practices template for creating an engagement charter. Using this template can help save production time as well as increase quality as this template represents several iterations of experience. Usage of this template is strongly recommended.

XV. References

- Gorelick, C., Milton, N., and Aprile, K.: *Performance Through Learning: Knowledge Management in Practice*, Butterworth-Heinemann Ltd, Oxford, UK (2004).
- Milton, N.: *Knowledge Management for Teams and Projects*, Chandos Publishing (Oxford) Ltd, Oxford, UK (2005).
- Collison, C. and Parcell, G. *Learning to Fly: Practical Knowledge Management from Leading and Learning Organizations*, second edition, Capstone Publishing Ltd, Chichester, UK (2004).
- Greenes, K., *Leveraging Knowledge and Experience for High Performance*, Presentation at the 6th Annual eGov Knowledge Management Conference, Wash D.C. (2005).
- Greenes, K., *Delivering on the Promise of KM*, Presentation at Braintrust Conference (2004)
- Unocal Corporation, *Networks at Unocal: A Case Study*, The Digital Energy Series-E&P Collaboration, Houston, Texas (2003)

Section 2.B
(1-40)